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COAL AGE

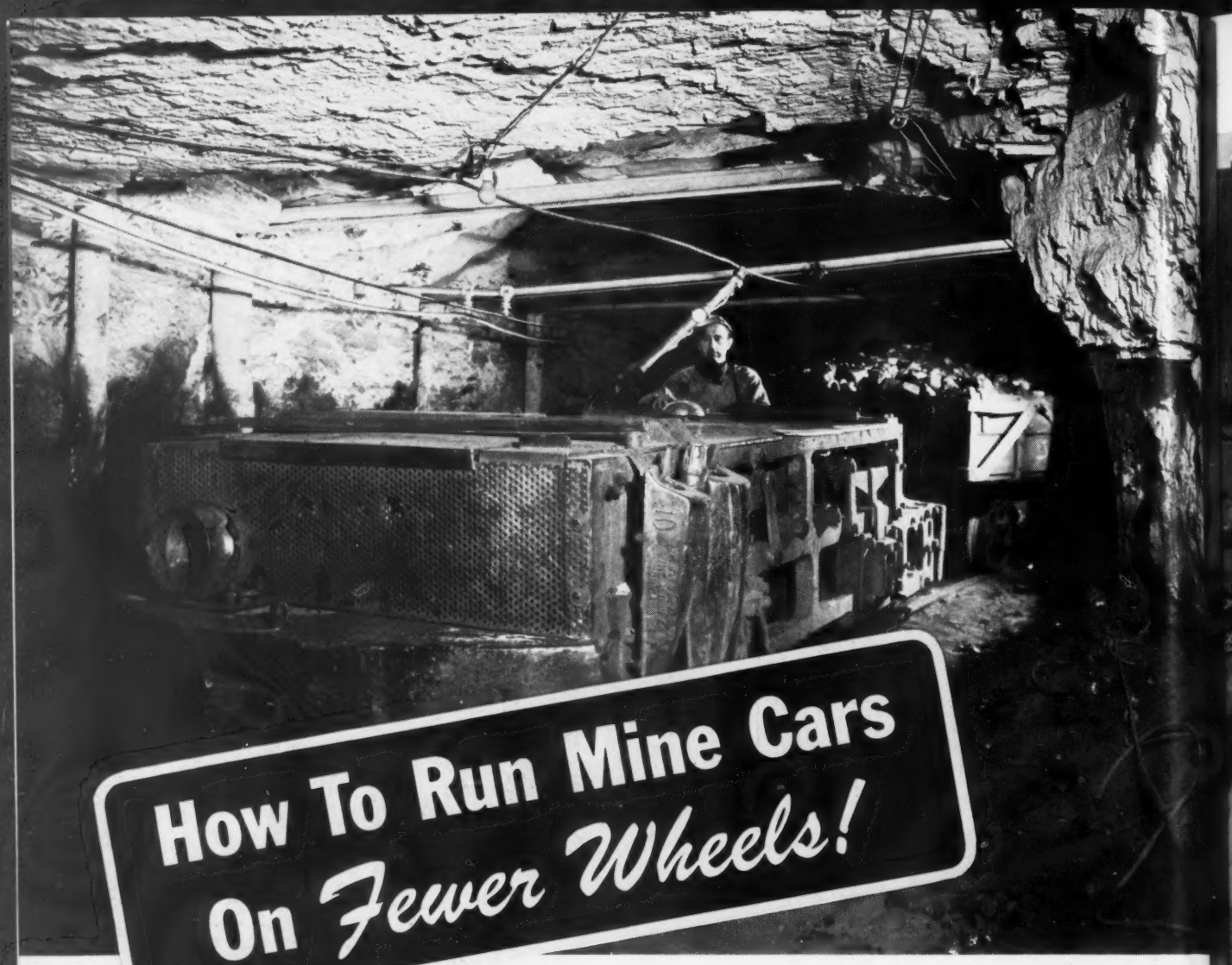
AUGUST 1943

McGRAW-HILL PUBLISHING COMPANY, INC.

Price 35 Cents

Coal Stabilization

Loader Improvements for Higher Tonnage • Salvaging Fine Coal for Power Use • Outcrop Stripping in Pennsylvania • Circular Escapeway in Shaft Lining • Ignitron Substations at Vesta • Mining Congress War Conference



How To Run Mine Cars On *Fewer Wheels!*

SUN MINE LUBRICANTS

"Reduce Wheel Replacements 22%...With 18% Less Grease"

How to get the longest possible service from mechanical equipment . . . and how to avoid production delays are both major problems to every coal mine operator. SUN "Doctors of Industry" and SUN MINE LUBRICANTS have long since proved their ability to help mine operators lick such problems.

Take the case of a Western Pennsylvania coal mine, where car wheel lubrication had always been a sore spot. Some of these cars are equipped with open-hub wheels, others with roller bearing wheels. Up to that time no lubricant had been found that would do a satisfactory job on both types. Acting on the recommendation of a SUN "Doctor of Industry," a switch was made to SUN Mine Car Grease No. 7 for Winter use and No. 9 for Summer use.

The results tell the story! Grease did not separate or solidify in the open-hub wheels . . . Grease consumption was cut down 18% . . . wheel replacements were reduced 22% . . . 3 cars were added to each haul!

In *many* mines . . . both large and small . . . SUN MINE LUBRICANTS have accomplished remarkable results in prolonging the life of all kinds of equipment . . . in saving valuable maintenance time . . . in reducing the cost of lubrication.

Let a SUN "Doctor of Industry" and SUN MINE LUBRICANTS go to work on some of your tough lubrication jobs. Just write to . . .

SUN OIL COMPANY, *Philadelphia*

Sun Oil Company, Limited, Toronto, Canada

SUNOCO

SUN INDUSTRIAL PRODUCTS

HELPING INDUSTRY HELP AMERICA

How rubber prevents a building B-O-O-M

A typical example of B. F. Goodrich development in rubber

THE spark that jumps from your hand to the door knob when you cross a carpeted room could make a chemical or powder plant blow up.

In factories, rubber V belts—like the one that turns the fan in your automobile engine—rub against the metal pulleys and build up this static electricity. Because rubber is an insulator and does not conduct electricity, the static stayed in the belts and built up until it was strong enough to jump—*and spark.* Then, if powder, chemical or gasoline was in the air—B-O-O-O-M! Unless belts could be made of some material that would let the current flow away as it flows through a copper wire the danger of explosion would never be far away.

B. F. Goodrich development men went to work to change the very nature of rubber. They found they could add chemicals to rubber that would make it conduct electricity but made it too stiff to use. The problem became one of finding a rubber so soft that the added chemicals stiffened it to the exact degree for use. Finally they found the ideal combination. The result was a rubber compound that has *one billion times* the ability of ordinary rubber to carry electricity.

Belts were made of this new development and today these B. F. Goodrich static-discharging V belts are at work in powder and chemical plants all over the country. Here is another example of B. F. Goodrich development for war that will serve in peace, too—safer compressors in gasoline stations, and no static shock from your washing machine. And there are other uses that you might want to investigate for your product or plant. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F. Goodrich

RUBBER *and* SYNTHETIC *products*

A QUALITY LUBRICANT RE

Thanks to the High Quality of Hulburt Quality Grease, coal mine cars and equipment require less attention, fewer stops. Hulburt's longer lubricating life means less man-power behind the grease guns—more man-power behind the machine guns . . . Bearings that must last longer *will* last longer, to help you get out your share of the 44 million *additional* tons demanded this year from the coal industry . . . If you haven't yet had a down-in-the-mine survey by a Hulburt Lubrication Specialist write us today.

HULBURT OIL & GREASE COMPANY

Specialists in Coal Mine Lubrication

PHILADELPHIA . . . PENNSYLVANIA

HULBURTQ

RELEASES MANPOWER
QUALITY GREASE

PHILCO BATTERIES pack the extra wallop you need for today's mining service!

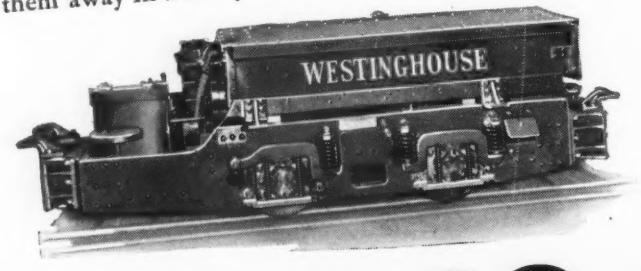
Never in mining history has America needed greater production . . . or needed it faster!

For that reason Philco Locomotive Batteries today contribute more to successful mine operation than ever before! Every Philco cell is engineered to give you *extra wallop*—the surge of power needed to pick up a long trip of loaded cars from a standing start, and haul them away in a hurry!

You get maximum capacity, too. Philco Batteries keep locomotives in operation long after ordinary batteries are back on the charging racks!

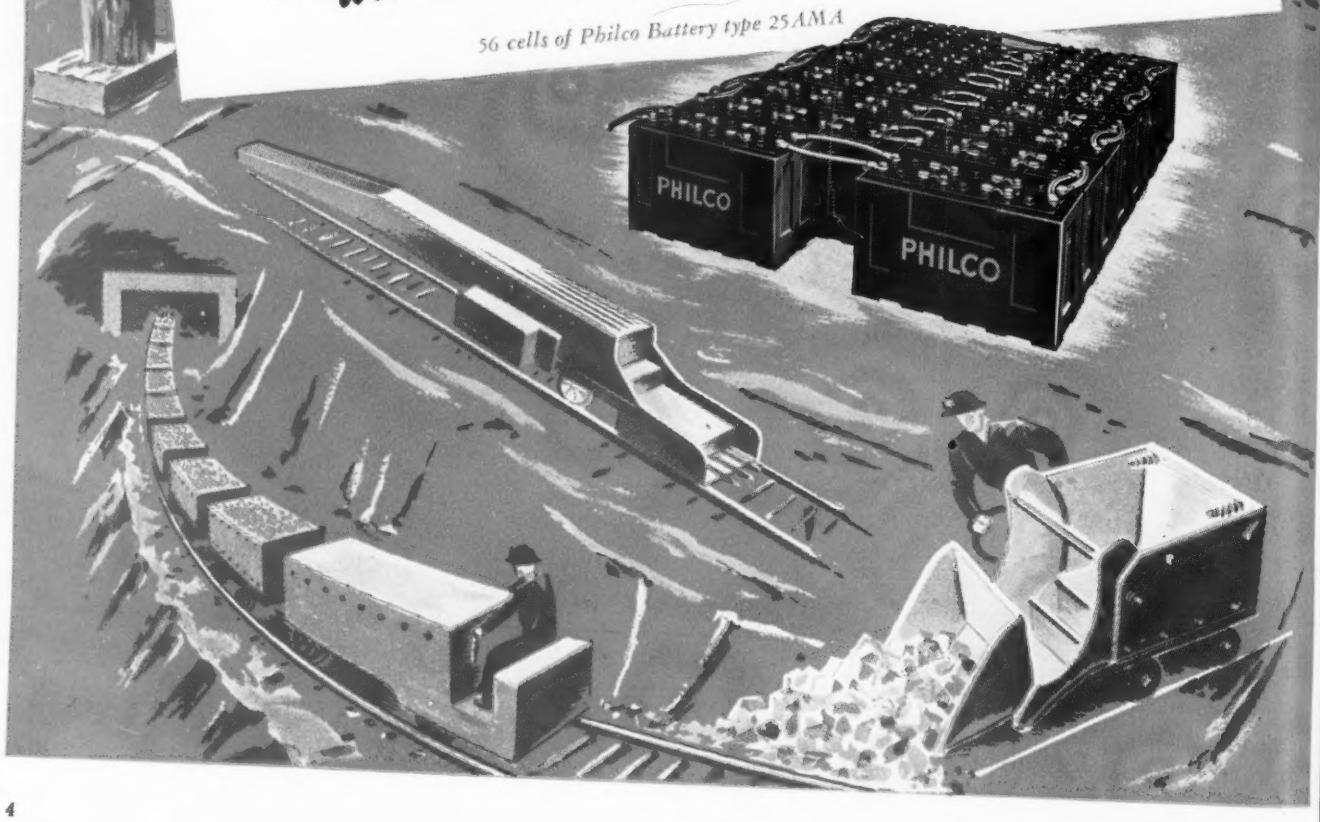
On your next replacement, get the facts on Philco Batteries. Call your local Philco representative or write direct for latest mine battery catalog.

PHILCO CORPORATION
STORAGE BATTERY DIVISION
TRENTON 7, NEW JERSEY



Replace with **PHILCO** *Mine Batteries*

56 cells of Philco Battery type 25AMA



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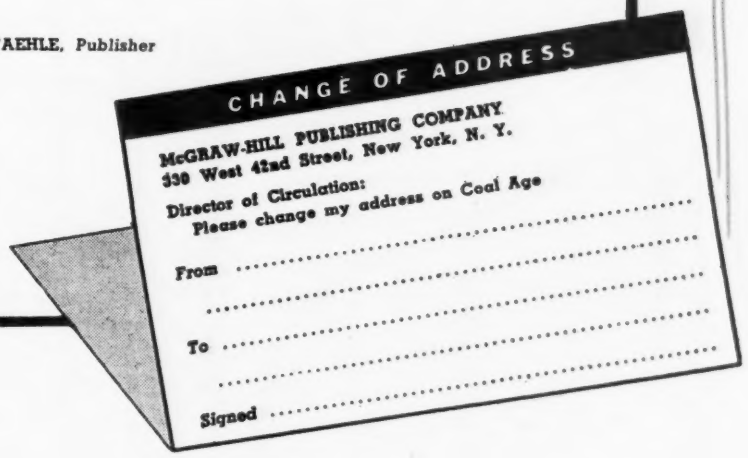


COMING COAL AGE ATTRACTIONS

• Mining with conveyors—chain or duckbill-equipped shaker types—is the subject of mechanical-production articles now in preparation for Coal Age use. One will detail practices at a new anthracite operation, while the other will sketch progress in duckbilling coal in a leading bituminous field. Both are scheduled for early appearance and, when work is completed, will be supplemented by articles on new developments at mines employing mobile loaders, especially operations which have installed large cars and transfer hoppers to handle coal.

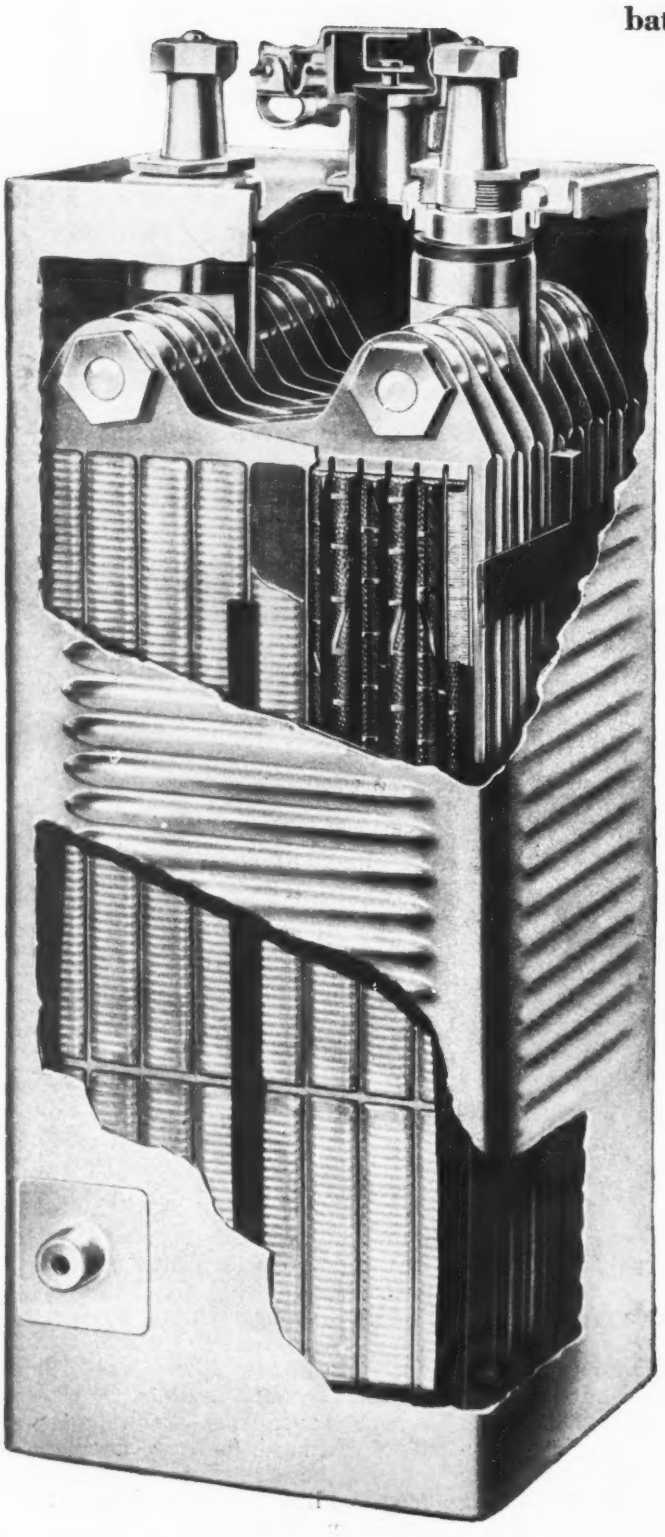
• Stripping material in preparation includes a description of the use of draglines at an anthracite operation to eliminate hauling spoil away from the cut. A second article will deal with the use of a stacker at a large bituminous operation. The editors also have in the works a series on stripping fundamentals.

• Dustproofing of coal is a vital problem made even more critical as a result of wartime conditions. Coal Age will present next month the latest thought on wartime dustproofing as developed in investigations by the Battelle Memorial Institute.

• Maintenance and electrical questions scheduled for early discussion include the care of small electrical tools and how to use transformers for maximum efficiency.

For Newcomers in Coal Mining

This is a single cell of an Edison Alkaline Ba tery. It is entirely different from the stora battery in your automobile.



This Edison cell is built of steel throughou Its alkaline electrolyte is a preservative steel. Its most distinctive performance chara teristic is its great dependability.

Batteries of these cells are used in industri trucks, in railway cars, in mine locomotiv and, in general, wherever insurance agai sudden and unexpected failure is necessar

This insurance is doubly important tod because delays in essential war producti cannot be tolerated. The durability of the batteries also makes them long-lived a therefore economical to operate.

The Edison Alkaline Battery cell, as pictur here, is precisely and ruggedly fabricate In the days of slogans it was tagged: "Bu like a watch—rugged as a battleship."

Millions of these cells are now in use. If y want the story of this ingenious inventi of Mr. Edison's, send for Booklet EAB Address Edison Storage Battery Division Thomas A. Edison, Inc., West Orange, N.

Edison
ALKALINE BATTERIE

FOR *Every* PURPOSE · · EVERY CONDITION

1. Increased production at lower cost
2. Trouble-free performance
3. Tools designed for every type of job
4. Elimination of excess weight
5. Maximum safety for driller
6. Vibrationless operation due to accurate alignment
7. Adapted to all powder sizes—CARDOX and AIRDOX
8. Hexanspeed coupling operates without nails, cotters, or hammers
9. All COALMASTER Tools are matched sets

● Our representatives are drilling specialists—Men trained by experience to select the tools that will best meet your particular requirements. They are eager to help solve your drilling problems with the objective of mining coal at minimum cost. Their services are available upon request without cost or obligation.

COALMASTER

BLAST HOLE DRILLING *Tools*

CENTRAL MINE EQUIPMENT CO.
ST. LOUIS, MO.

PRODUCTION RECORDS At Crescent Coal Co. Should Interest Many Operators!

A trip of 6 Ton S-D 1-2-3 "Automatics" loaded to capacity. Note side boards for added capacity.

A trip of 4 Ton S-D 1-2-3 "Automatics" being discharged at underground receiving bin.

The answer to any operator's dream of big production can be found at the Paradise mine of the Crescent Coal Co., Central City, Ky.

At this mine, you will find the unquestionable proof of the effectiveness of S-D 1-2-3 "Automatics" for producing the greatest possible tonnage at the lowest cost because Crescent's production methods are built around S-D 1-2-3 "Automatics."

With only 53 cars, and with an average haul of 1¼ miles, Crescent is producing an average of 70,000 tons of coal per month, working two shifts per day, six days per week.

Mr. Charles M. Rodman, Gen. Mgr. of Crescent Coal Co., says: "I am familiar with every known type of modern mine car and I know from experience that we could not begin to equal our present production if it were not for S-D 1-2-3 "Automatic" cars. And most important, is the fact that this tonnage is being produced at a per ton cost that we are mighty proud of. In addition, we figure that the easy running of S-D 'Floater' Wheels are saving us 1½ to 2 cents per ton in power savings alone."

"Because of our fine experience with these cars, I naturally, am enthusiastic in my recommendation of them to other operators."

Mr. Charles M. Rodman, Gen. Mgr. of Crescent Coal Co.

Crescent installed 42, 4 ton, 12 ft. length, S-D 1-2-3 "Automatics" in June 1939. Incidentally, one of these cars was exhibited at Cincinnati Mining Congress before delivery, and the same car, after two years of constant service was returned to Cincinnati, in 1941, from the mine, for display again.

Ten additional cars of 16 ft. length, 6 ton capacity, have since been added and they work perfectly right along with the 12 ft. cars.

The ruggedness of S-D 1-2-3 "Automatics," their

bility to take the punishment, and proof of their many years of service, because of the easy life they lead, are all brought out by the statement of Mr. Ward Padgett, Asst. Gen. Mgr. of Crescent. Mr. Padgett says: "Our 53 cars average, believe it or

Cars are loaded by portable conveyor loaders.

not, 7½ trips per shift or 15 trips per day. Even though we put them through, dumping by actual count at the rate of 18 to 22 cars per minute, we seldom send a car to the shop."

"Recently we experienced a heavy rock fall on a car, so large it was necessary to drill and dynamite for removal, but the car was not fazed."

Mr. Ward Padgett, Asst. Gen. Mgr. at Crescent.

"The 'Floater' wheels on our cars were greased for the first time 3 years after installation, and all were in fine shape. We have had only 3 wheel failures since the beginning."

"Our men like these cars because they stay on the track."

Crescent uses a well maintained track, keeping

125 Ton receiving bin where loaded cars are discharged automatically.

Feeding coal from receiving bin to conveyor to tipple.

all water from haulage-way. Although the original cars and wheels have traveled approximately 25,000 miles, they show no apparent wear, and "Floater" wheels have been greased only once. We realize that such performance will appear almost unbelievable to some, yet, we give you the facts. And incidentally, this Crescent story proves conclusively, how reasonable care will add years to the life of your cars and wheels.

The Crescent experience is typical of many other mines using S-D 1-2-3 "Automatics" for maximum production, lowest cost, with minimum manpower.

Crescent Coal Co. tipple. Note conveyor belt ramp at right coming out of mine.

Is it any wonder that we make these modern cars available to you on a liberal rental plan, and at this time when you probably need them most. Let one of our engineers give you complete details of what S-D 1-2-3 "Automatics" can do to improve results in your mine. Conditions make it advisable for you to figure ahead, NOW!

Sanford-Day Iron Works

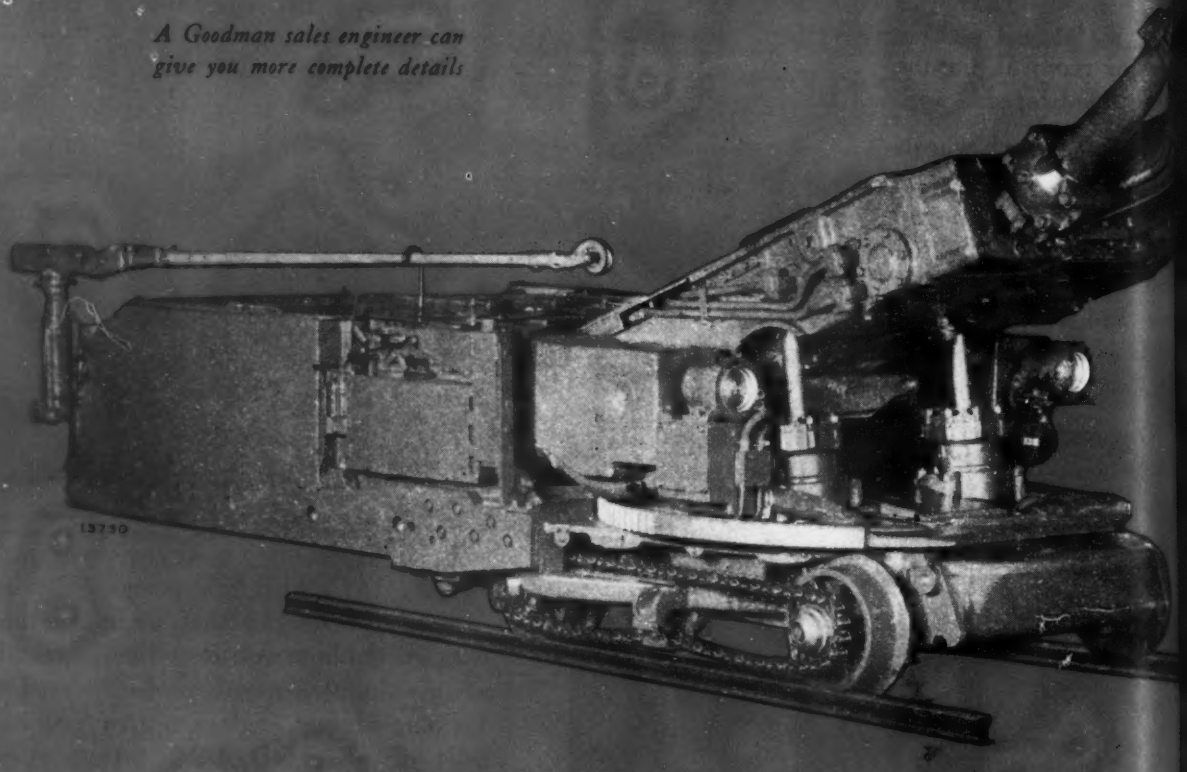
KNOXVILLE • TENNESSEE

The Goodman

A TRACK MOUNTED **SLABBER** *with Universal*

- horizontal cutting range from 9 inches below rail to 8 feet above, no blind spots
- shearing cuts can be made from track center line up to 9 feet to either side
- all movements of cutter bar are hydraulically controlled, full power available for all motions used simultaneously
- low over-all height (34½ inches) makes machine suitable for both low and high coal
- motor driven cable reel automatically pays off or spools cable while machine is in operation

A Goodman sales engineer can give you more complete details



ARMY E NAVY

GOODMAN MANUFACTURING COMPANY

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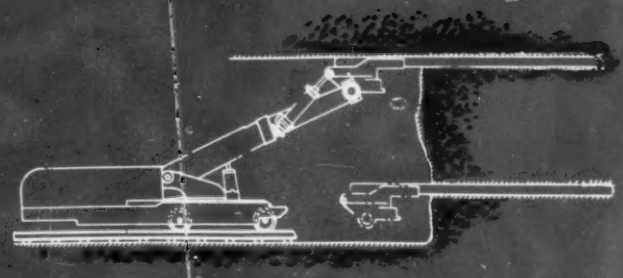
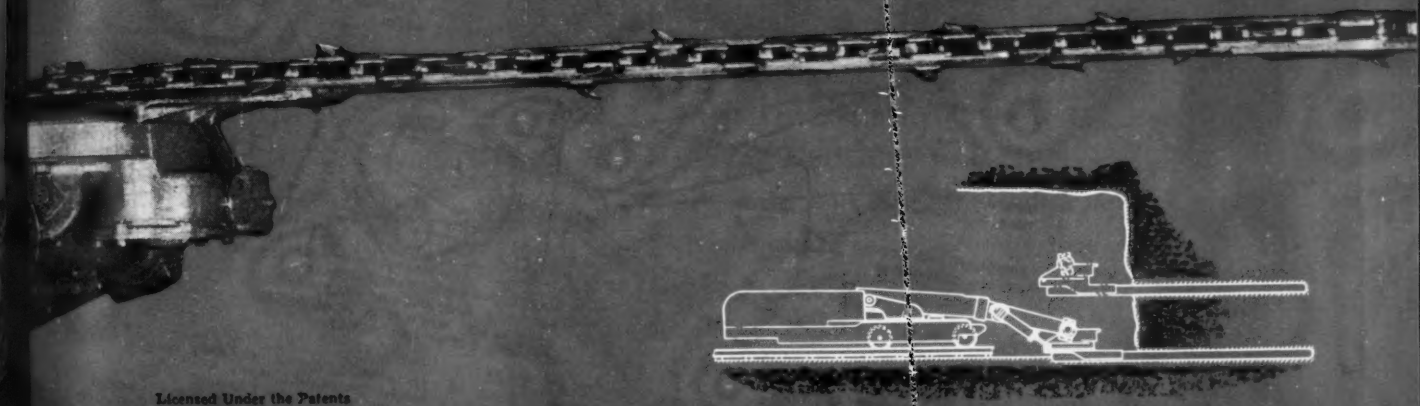
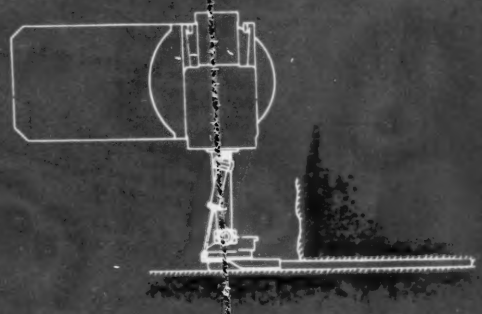


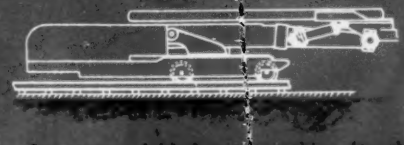
1. Vertical range of cutting element in top cutting position.



2. Vertical range of cutting element in bottom cutting position.



3. Cutting element in ro shearing position.



4. Cutter arm folded over machine for short tramming length.

Licensed Under the Patents of E. C. Morgan, Nos. 1766961, 1766962, 1767132, 1958325

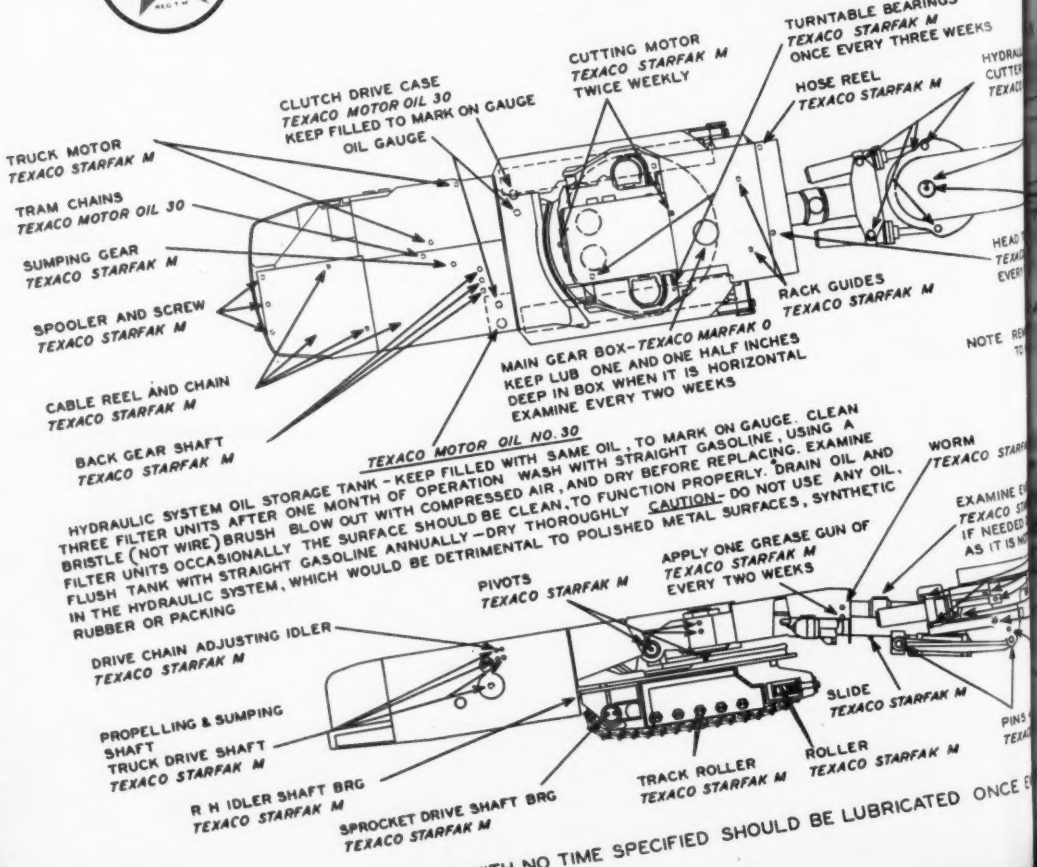
N Y HALSTED STREET AT 48TH • CHICAGO, ILLINOIS

TESTED METHODS fo IN

TEXACO MAINTENANCE LUBRICATION C

JEFFREY UNIVERSAL COAL CUTTING MACHINE

CLASS 29-UC


TRUCK MOTOR
TEXACO STARFAK M
TRAM CHAINS
TEXACO MOTOR OIL 30
SUMPING GEAR
TEXACO STARFAK M
SPOOLER AND SCREW
TEXACO STARFAK M
CABLE REEL AND CHAIN
TEXACO STARFAK M
BACK GEAR SHAFT
TEXACO STARFAK M
CLUTCH DRIVE CASE
TEXACO MOTOR OIL 30
KEEP FILLED TO MARK ON GAUGE
OIL GAUGE
CUTTING MOTOR
TEXACO STARFAK M
TWICE WEEKLY
TURNTABLE BEARINGS
TEXACO STARFAK M
ONCE EVERY THREE WEEKS
HOSE REEL
TEXACO STARFAK M
RACK GUIDES
TEXACO STARFAK M
MAIN GEAR BOX- TEXACO MARFAK O
KEEP LUB ONE AND ONE HALF INCHES
DEEP IN BOX WHEN IT IS HORIZONTAL
EXAMINE EVERY TWO WEEKS
TEXACO MOTOR OIL NO. 30
HYDRAULIC SYSTEM OIL STORAGE TANK - KEEP FILLED WITH SAME OIL, TO MARK ON GAUGE. CLEAN
THREE FILTER UNITS AFTER ONE MONTH OF OPERATION WASH WITH STRAIGHT GASOLINE, USING A
BRISTLE (NOT WIRE) BRUSH BLOW OUT WITH COMPRESSED AIR, AND DRY BEFORE REPLACING. EXAMINE
FILTER UNITS OCCASIONALLY THE SURFACE SHOULD BE CLEAN, TO FUNCTION PROPERLY. DRAIN OIL AND
FLUSH TANK WITH STRAIGHT GASOLINE ANNUALLY - DRY THOROUGHLY CAUTION - DO NOT USE ANY OIL,
IN THE HYDRAULIC SYSTEM, WHICH WOULD BE DETRIMENTAL TO POLISHED METAL SURFACES, SYNTHETIC
RUBBER OR PACKING
PIVOTS
TEXACO STARFAK M
APPLY ONE GREASE GUN OF
TEXACO STARFAK M
EVERY TWO WEEKS
WORM
DRIVE CHAIN ADJUSTING IDLER
TEXACO STARFAK M
PROPELLING & SUMPING
SHAFT
TRUCK DRIVE SHAFT
TEXACO STARFAK M
R H IDLER SHAFT BRG
TEXACO STARFAK M
SPROCKET DRIVE SHAFT BRG
TEXACO STARFAK M
TRACK ROLLER
TEXACO STARFAK M
ROLLER
TEXACO STARFAK M
SLIDE
TEXACO STARFAK M

ALL POINTS WITH NO TIME SPECIFIED SHOULD BE LUBRICATED ONCE E

TEXACO

TEXACO

INCREASING TONNAGE!

SEAL BEARING
TEXACO STARFAK M
THREE TIMES EVERY SHIFT
SPROCKET SHAFT
TEXACO STARFAK M
THREE TIMES EVERY SHIFT
ONCE EACH WEEK AND APPLY TEXACO CRATER NO.1
HYDRAULIC CYLINDER PINS AND
CUTTER BAR SUPPORT
TEXACO STARFAK M
TIMKEN BEARING – TEXACO STARFAK M
TWICE EVERY SHIFT
TIMKEN BEARING – OPPOSITE SIDE
TEXACO STARFAK M
HEAD GEAR BOX – KEEP LEVEL ABOUT ONE HALF
OF AN INCH BELOW FILLING PIPE WHEN HEAD IS
IN POSITION SHOWN. TEXACO MARFAK 0
EXAMINE EVERY TWO WEEKS

THE coal mining industry is faced with the necessity of producing in 1943 an all-time high output of 665 million tons. The shortage of experienced manpower is a problem.

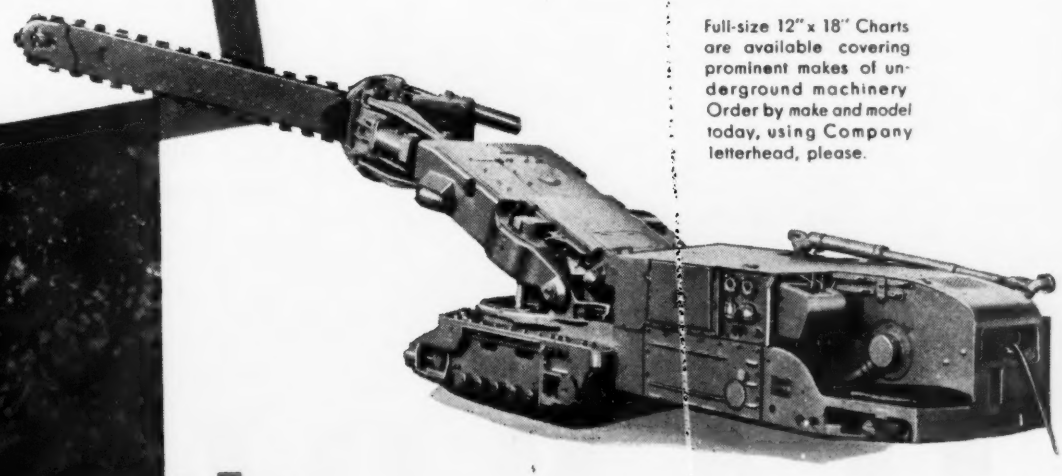
Coal mines everywhere are keeping their mechanized equipment on the job by following this tested method of getting more tonnage . . . Texaco Maintenance Lubrication Charts.

These Texaco Charts 12″ x 18″ in size, for display at all lubricating stations, show clearly just *where, when* and *with what* lubricant to service each lubrication point of cutters, loaders, locomotives, etc. . . . *with lubricants approved by the manufacturer.*

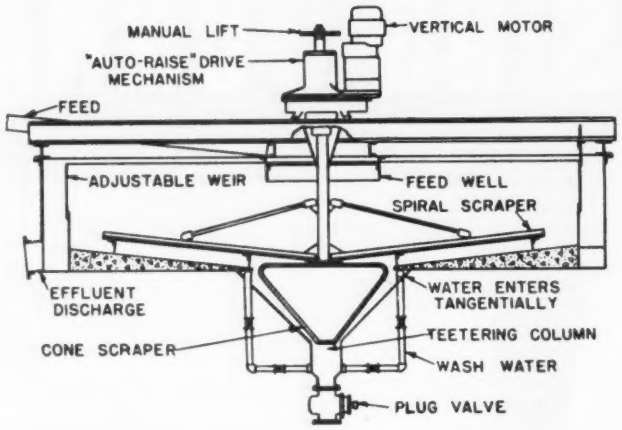
Following Texaco Maintenance Charts will help to assure maximum life and less time out for your equipment. Order by make and model from—

The Texas Company, *National Sales Division,* Dept. C, 135 East 42nd St., New York 17, N. Y.

Full-size 12″ x 18″ Charts are available covering prominent makes of underground machinery. Order by make and model today, using Company letterhead, please.



Texaco Lubricants FOR THE COAL MINING INDUSTRY



HARDINGE HYDRO-CLASSIFIER FOR RECOVERY OF FINE COAL

A 30 foot diam. Hydro-Classifier was installed to recover minus 3/16 inch plus 48 mesh coal from wash water

HARDINGE EQUIPMENT

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•

3500 G.P.M. feed to the Hydro contained 6.2% solids with 61% plus 48 mesh coal.

43 tons per hours of coal at 72.4% plus 48 mesh containing 7.5% ash was produced.

The overflow of 9 tons per hour, 2.6% plus 48 mesh and 12.5% ash, was sent to waste.

Bulletin 31-C

•

HARDINGE

COMPANY, INCORPORATED - YORK, PENNSYLVANIA

New York, 122 East 42nd Street Chicago, 205 West Wacker Drive San Francisco, 501 Howard Street Toronto, 200 Bay Street

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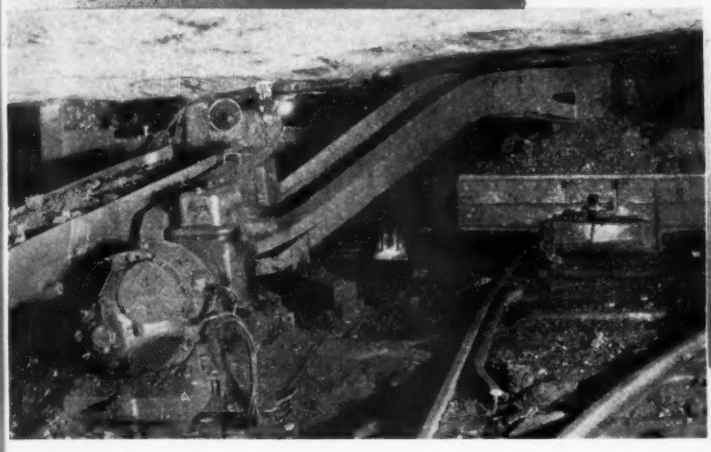


ANTIFRICTION BEARINGS

Smooth-running ball or roller bearings withstand end thrust from either direction, stay smooth. Grease is sealed in, dirt is sealed out. SK Motors are also available with the famous Sealed-Sleeve Bearings.

RIGID, ROLLED STEEL FRAME

Rigid, one-piece frame provides a uniform magnetic path, and vastly improves commutation. Forged steel feet welded to the frame anchor the motor securely in place and prevent twisting or weaving.

FORM-WOUND, MICA-INSULATED COILS

Armature coils are individually form-wound and insulated before assembly. Selected mica over the slot portions, and repeated dipping and baking in insulating varnish effectively prevent electrical breakdowns.

EASILY ADJUSTED BRUSH HOLDERS

All brush holders are readily accessible. Any one of them may be adjusted or removed with an ordinary screw driver or wrench without disturbing the others. Rotating end bracket adjusts position of brushes.

DEEP COMMUTATOR BARS

Extra deep segments of hardened copper insure long life. Wedge design tightly locks commutator assembly, prevents high bars. As a result, commutation is practically sparkless, even under severe overloads.

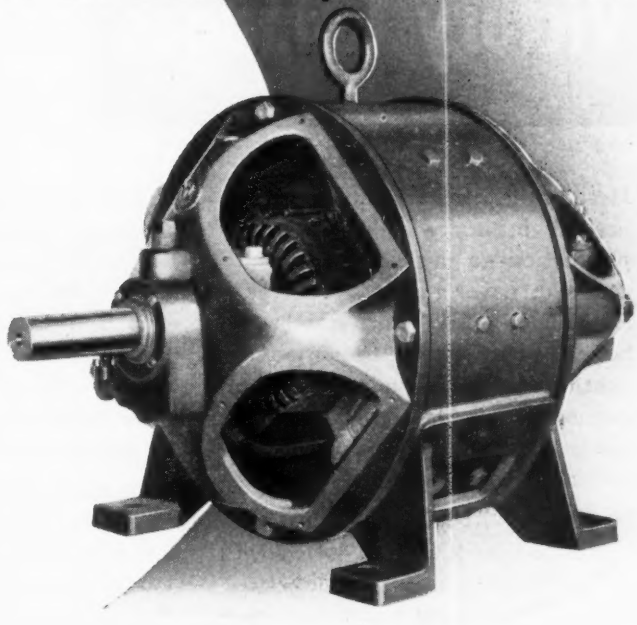
COMPLETE SELECTION

SK Motors are available from 1 to 200 hp with the proper torques and performance characteristics, ratings and enclosures to meet every mining requirement, and to do every mining job.

PLUS INTERCHANGEABLE PARTS to cut costs . . . speed maintenance

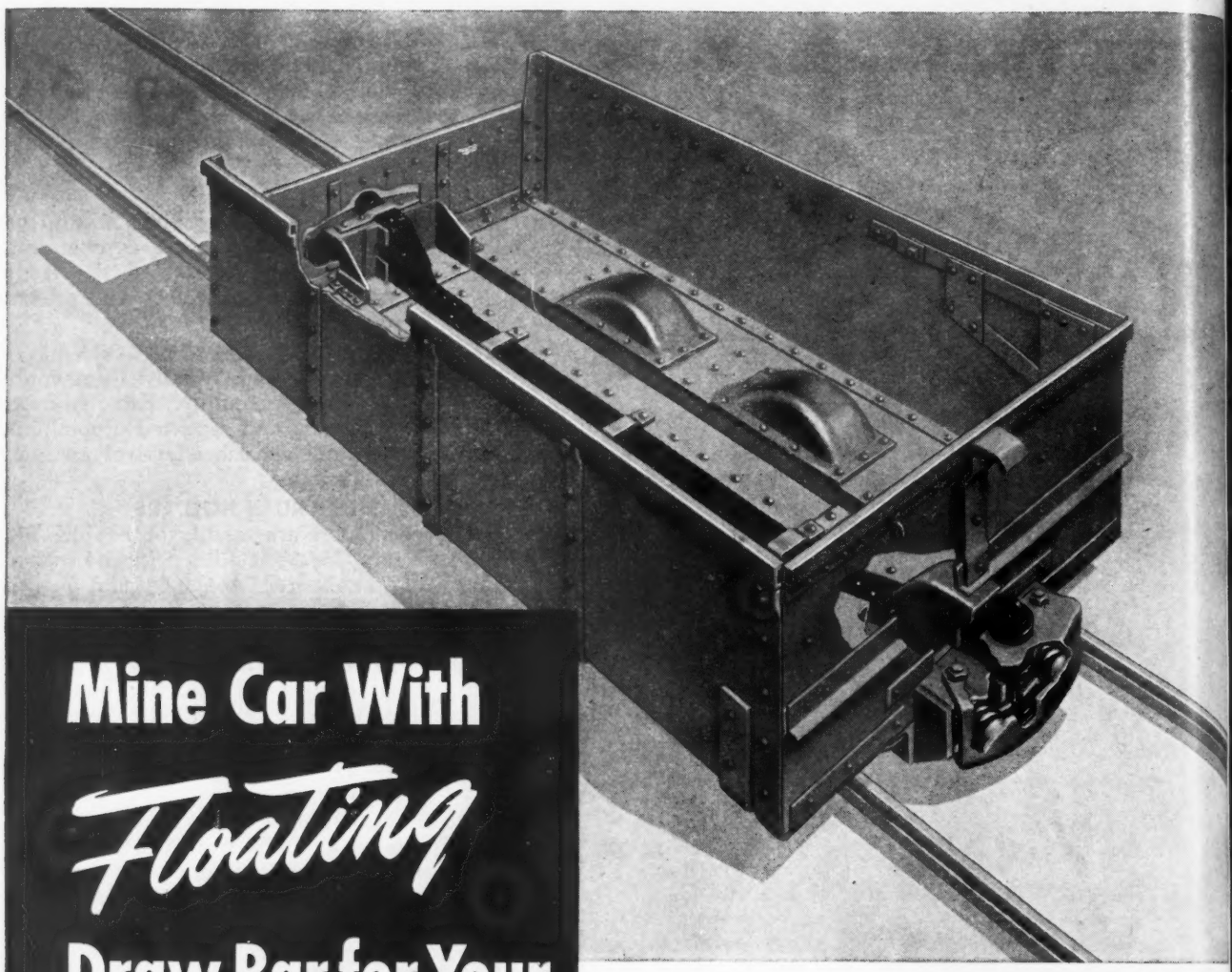
Wearing parts on SK Motors have been held to the same dimensions for 29 years. Parts for today's motors will fit the oldest SK Motor in your mine. By standardizing on SK Mine Motors you simplify and reduce your replacement parts supply problems. Maintenance is speeded up, parts can be replaced quickly, motors returned to service sooner.

SK Mine Motors have been standard for underground service since 1911. Today, more Westinghouse Motors of this type are in use than any other make. It will pay you to standardize on them in your mine. Call your nearest Westinghouse representative for complete information. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., Dept. 7-N. J-21211



Westinghouse **SK Mining Motors**

CARBOX



Mine Car With *Floating* Draw Bar for Your Victory Tonnages

Phantom view of Bethlehem's new mine car. Note at each end the spring buff and draft connected by the floating draw bar.

Here is the new, sturdier mine car needed in today's high-pressure production—a mine car with ends that can never pull off. This new Bethlehem Mine Car stands up better in hard service because of its floating draw bar, a sturdy steel member running free from end to end inside the car, and transmitting the pull as well as shocks through draft springs to the rear end of the car.

Here's how it works. When the car is traveling in either direction the pull at the front is always transmitted through the floating draw bar to the springs at the back end of the car.

In this way, the rear springs are the ones compressed; there is no pull on the front end of the car at any time. This action tends to push the car from the rear instead of pull it from the front. It prevents the ends from being pulled off. When used in a train there is no strain on the individual car; the pull is transmitted directly from one draw bar to the next.

Furthermore, the outside location of the springs eliminates spring failure resulting from corrosive action of the coal.

Bethlehem will be glad to give you more details of this new-type mine car. Get in touch with the nearest Bethlehem representative, or write direct to Bethlehem Steel Company, Bethlehem, Pa.

Other Bethlehem products to help you turn out Victory tonnages:

Steel Ties

Mine Track Equipment

Mine Car Wheels and Axles

Bolts, Nuts, Spikes

Wire Rope

Steel Timbering

Steel Pipe

Superior Hollow Drill Steel

BETHLEHEM STEEL

CARDOX

"THE NON-EXPLOSIVE MINING METHOD"

Raises TONNAGE and PRODUCTIVITY BY PERMITTING DEEPER CUTS

...e CARDOX rolls the coal forward, longer cutter bars can be used.

CARDOX is the answer to many wartime coal production problems. It helps, in many ways, to maintain low-cost tonnage . . . to step-up individual productivity of available men and machines.

For example, the extra *forward roll* of CARDOX-mined coal permits the use of longer cutter bars . . . makes it possible, at each cut, to provide 16% to 50% more coal per face for the loading machines. This saves 16% to 50% of the non-productive time spent each day in moving the loading machine. Add to this saving, the economy of the larger percentage of easier-to-load coarse sizes and the absence of work-retarding smoke and noxious fumes . . . and it is easy to see why CARDOX increases productivity and boosts tonnage while holding down costs.

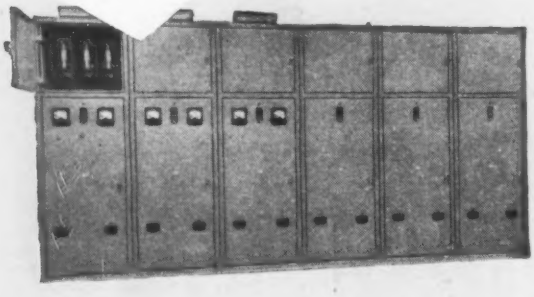
Write or wire for details of free demonstration in your own mine that proves the Practical Value of CARDOX in raising tonnage and productivity under wartime conditions.

CARDOX CORPORATION • Bell Building • Chicago

To Save Time at th

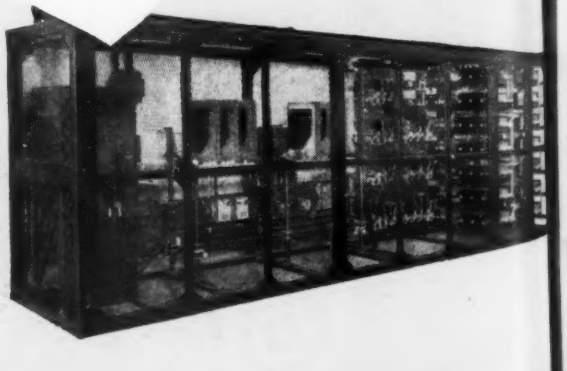
For larger motors, these 2300-volt starters combine EJ-2 current-limiting fuses and an oil-immersed contactor in a protective, metal cubicle. Side by side, they form a unit control board, with convenient bus connections to a "matching" incoming-line panel.

Compact assemblies of G-E magnetic starters in cubicles like this save installation wiring time. Our past experience in supplying them to other mines is a factor in reducing layout time.

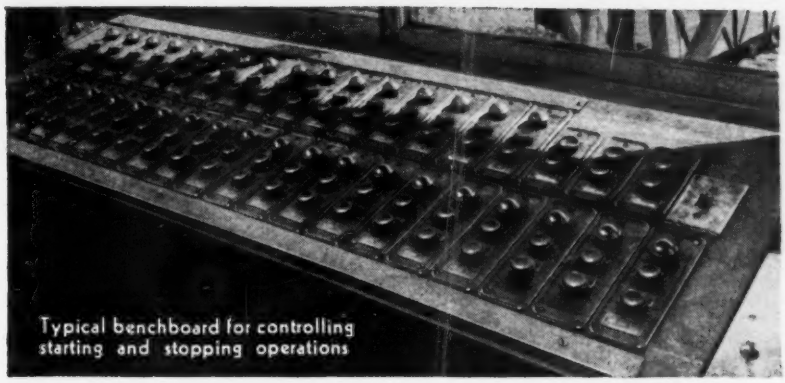


This group-assembled equipment for high-voltage, mine-hoist control is typical of assemblies on which G-E Engineers can help you save time by making greatest possible use of standard available units.

G-E combination magnetic switches in standard enclosures are quickly available for war-essential jobs. They have proved highly popular at coal preparation plants.

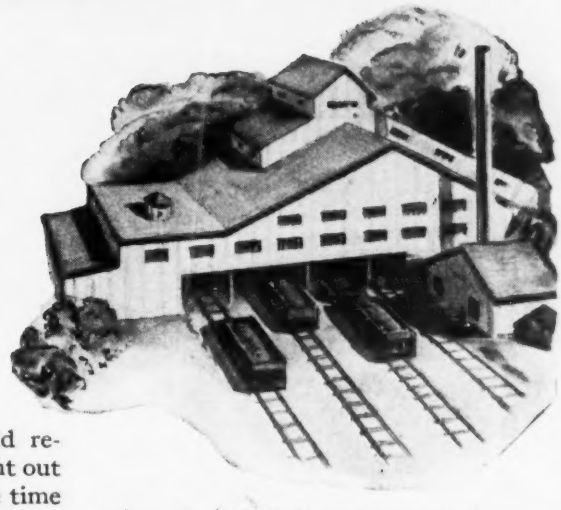


Tipple



Typical benchboard for controlling starting and stopping operations

Meet the SPECIAL NEEDS of COAL PREPARATION with STANDARD G-E CONTROL



Are you looking for a way to simplify the planning and speed up the installation of electric control at coal preparation plants? Do you want motor starters that are *especially* suitable for coal-plant service, yet avoiding delays for special engineering?

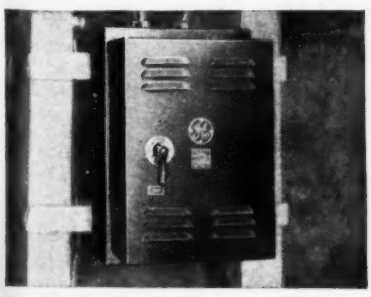
Here are the reasons why G.E. can help you unusually well:

1. We have an exceptionally wide range of *standard* starters and control units—furnished in dust-tight, water-tight, or "permissible" enclosures, as well as in general-purpose construction. Almost any coal-field requirement can be met "right out of the catalog," saving the time demanded by special designs.

2. G.E. has pioneered in developing self-contained combination motor-starters and cubicle-type control assemblies that are "set to go" once external connections are made. These units facilitate layout and save time in wiring.

3. G-E Engineers have "on tap" a broad fund of experience in applying the right control unit to the job. They'll help you plan an integral motor-control system for the entire preparation plant—a system that "goes together" easily and saves on maintenance.

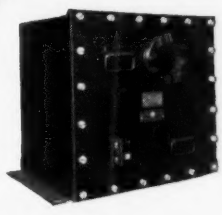
Underground, too, you'll find that G.E. has control equipment that can simplify and speed up the installation job, such as our new "Class BM" explosion-proof controllers. Better get in touch with your G-E representative today. *General Electric Company, Schenectady, N. Y.*



Standard G-E air circuit breaker, installed underground for protection of mine trolleys at cross-entries

NEW

. . . this enclosed a-c magnetic controller (Class "BM")



is rated as *permissible* for gassy mines, having passed Bureau of Mines tests. Available in a wide range of sizes, it is finding important applications as a result of the increasing use of a-c underground.

GENERAL ELECTRIC

667-18

WITH MINIMUM MAINTENANCE COSTS

"Chromated Zinc Chloride"-treated ties on this new haulageway will stand up under heavy pounding. They will stand up because "CZC"-treated wood resists destructive, weakening decay; is many times more durable than untreated wood, provides a firm rail bearing surface.

The fungous growths that attack wood flourish in the humid temperature of the average mine. They rapidly decay ties—quickly rob them of their natural strength.

But Du Pont "CZC" safeguards wood against early decay by making it repellent to fungous attack. It makes ties last many times longer—reduces maintenance—and pays for itself by eliminating early and frequent replacements. Damaged or rail cut ties can be recovered for use as permanent cribbing and lagging.

And here are important *extra* advantages of "CZC"-treated wood:

It is fire retarding.

It is clean, odorless and safe to handle.

If you are trying to keep repair costs down . . . if your maintenance crews are short-handed . . . and if you want to reduce accidents caused by weakened ties, timbers or fire—specify "CZC"-treated timber for *all* construction. There is ample chemical preservative and treating capacity for both military and essential mining needs.

Write today for your free copy of "Wood Preservation for Mines." E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington, Delaware.

DU PONT
REG. U. S. PAT. OFF.

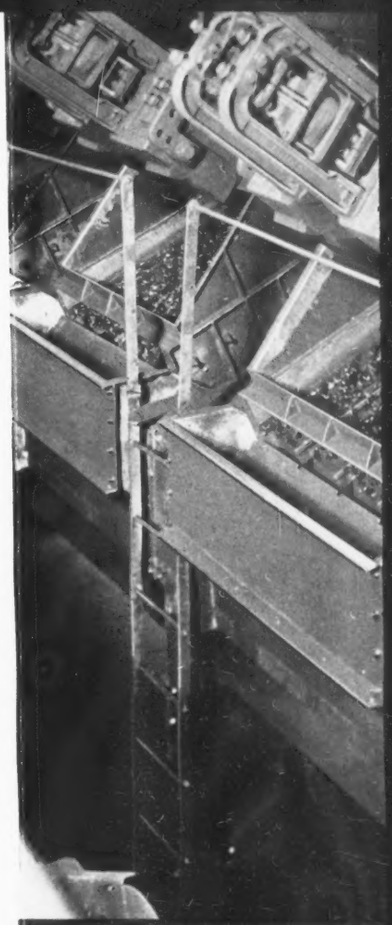
CZC

CHROMATED ZINC CHLORIDE

WOOD PRESERVATIVE

BETTER THINGS for BETTER LIVING . . . THROUGH CHEMISTRY

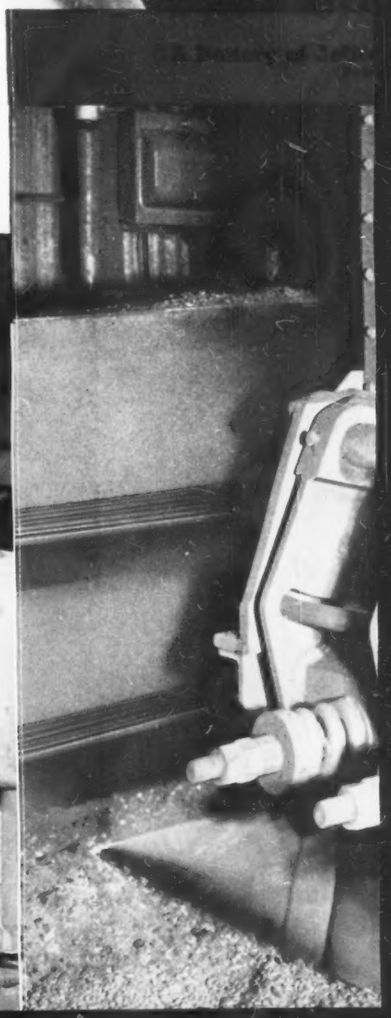
SIZING

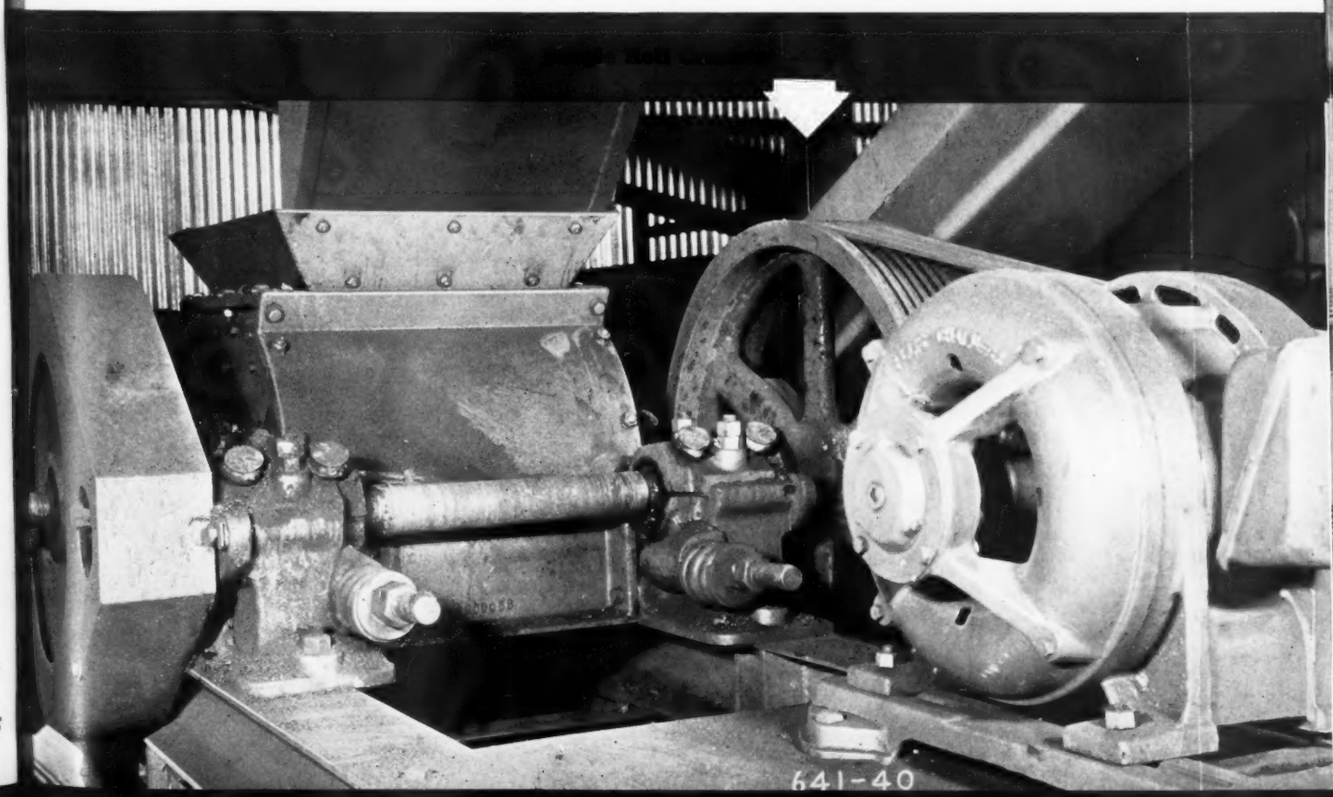


CRUSHERS . . . Nine sizes of single roll crushers for reducing large lumps to egg, nut and coarser stoker coal sizes in a single operation. Slow-speed 'Flextooth' crushers for reducing lump, egg or run-of-mine coal to any size product ranging from 2" to 3/8". Also 'Flex-Roll' crushers for small capacities. Minimum fines.

SCREENS . . . Particularly adapted to coal sizing. Sharp, high frequency vibrations minimize binding . . . guarantee high 'through-screen' capacity on fine coal. Jeffrey-Traylor electric vibrating screens are instantly adjustable . . . have no moving mechanical parts . . . may be totally enclosed for handling dusty coal.

CHAINS . . . CONVEYORS . . . DIVERSION CHUTES . . . JIGS . . . LOADING BOOMS PICKING TABLES . . . ELEVATORS





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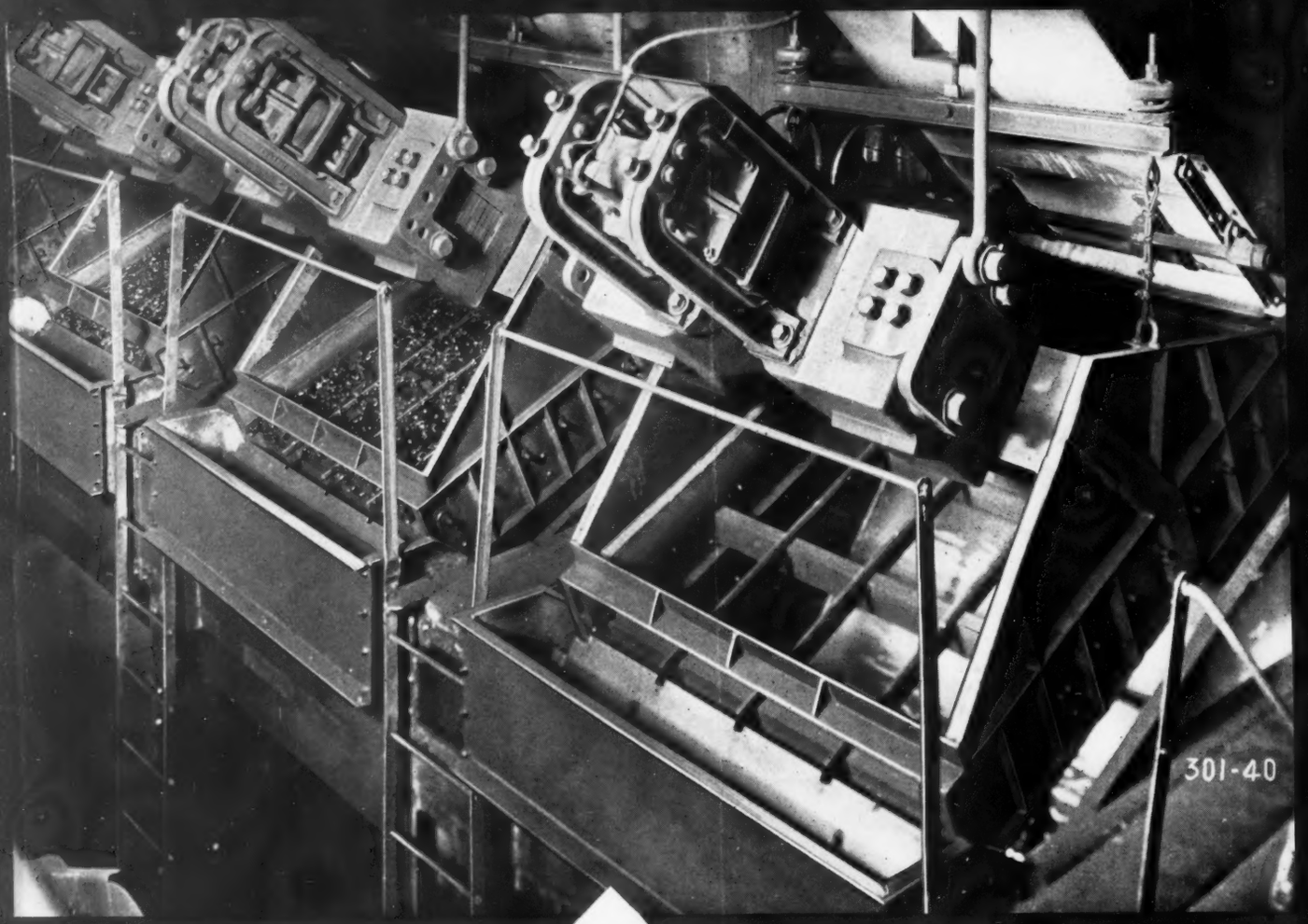
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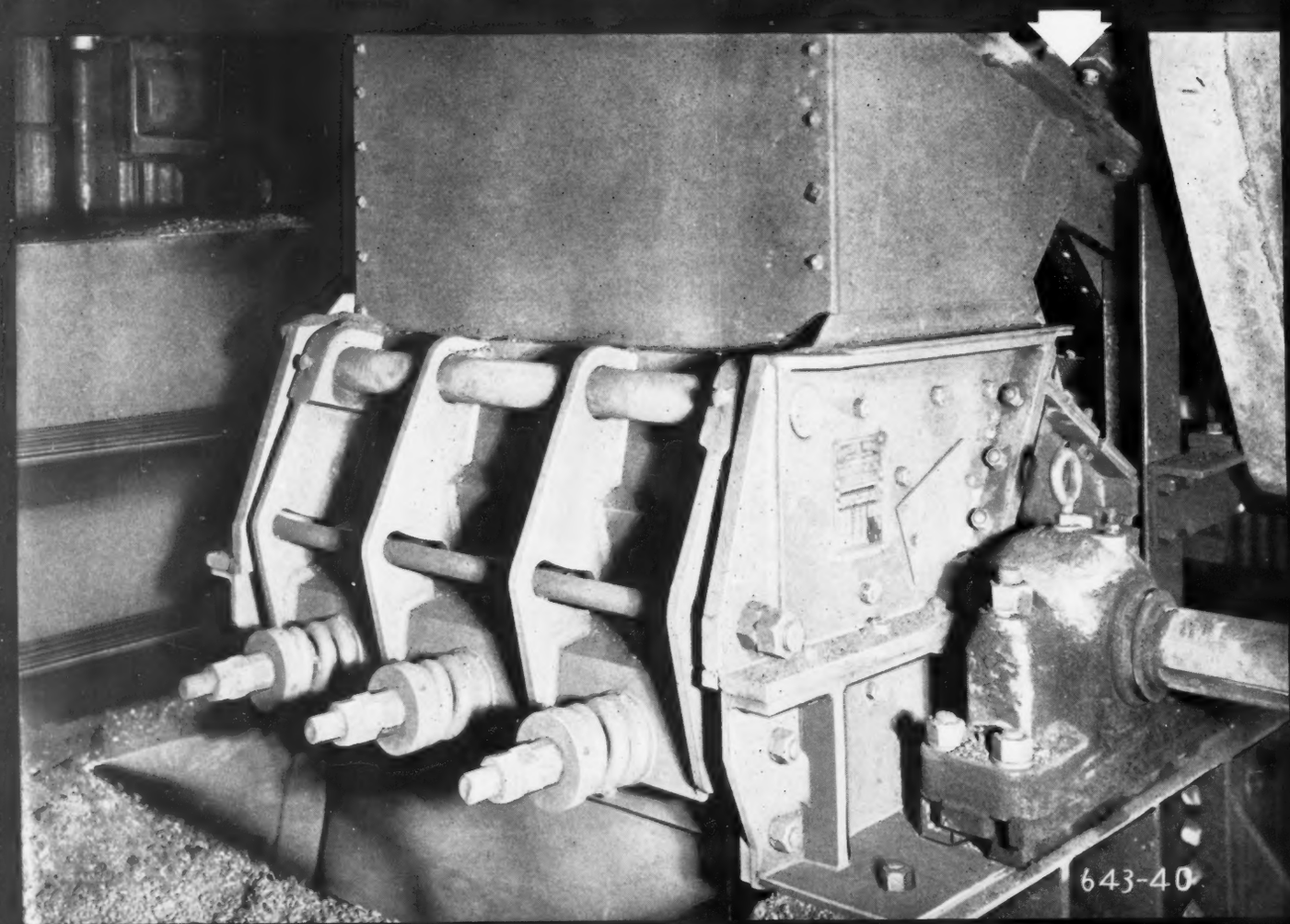
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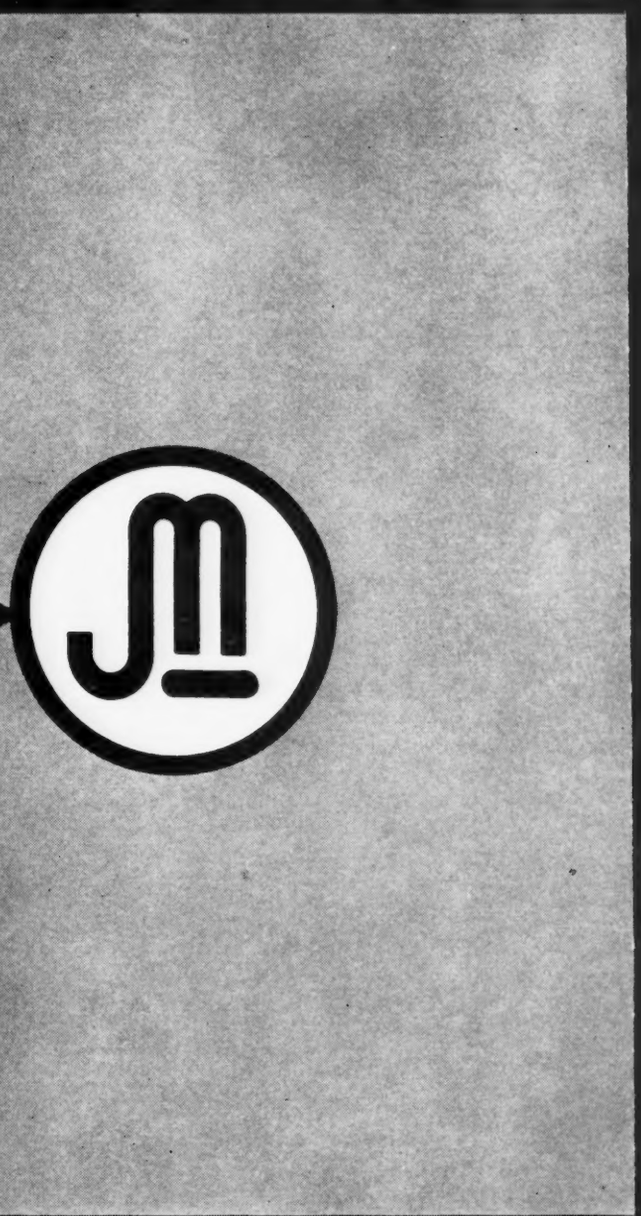
JEFFREY
EQUIPMENT for MECHANIZED MINING

LOADERS
CONVEYORS
LOCOMOTIVES
FANS
CRUSHERS
SCREENS
DRILLS
CUTTERS
BLOWERS
JIGS
RENEWAL PARTS



BELOW AND ABOVE GROUND
FROM FACE TO RAILROAD CAR

MAINTENANCE HINTS...

FOR CRUSHERS . . . **SINGLE ROLL**—Will operate satisfactorily with from 14" to 24" head of coal.

Adjustment of breaker plate will vary size of product—after setting be sure clamping rod is tight as possible.

Use a good grade of cup grease—turn down cups daily.

FLEXTOOTH—Feed at uniform rate no faster than rated capacity.

Size of product varies according to bar spacing—various size blocks for bars furnished at minimum expense.

Lubricate bearings with high quality grease. Check periodically—see that seals are keeping them clean.

Clean bearing housing every 3 to 6 months.

Keep bearings clean—free from grit.

FOR SCREENS . . . . KEEP wire cloth tight to insure long life

High vibration never produces maximum screening efficiency.

Keep vibrator bars tight to insure trouble-free operation.

Do not exceed maximum amperage.

THE JEFFREY MANUFACTURING COMPANY

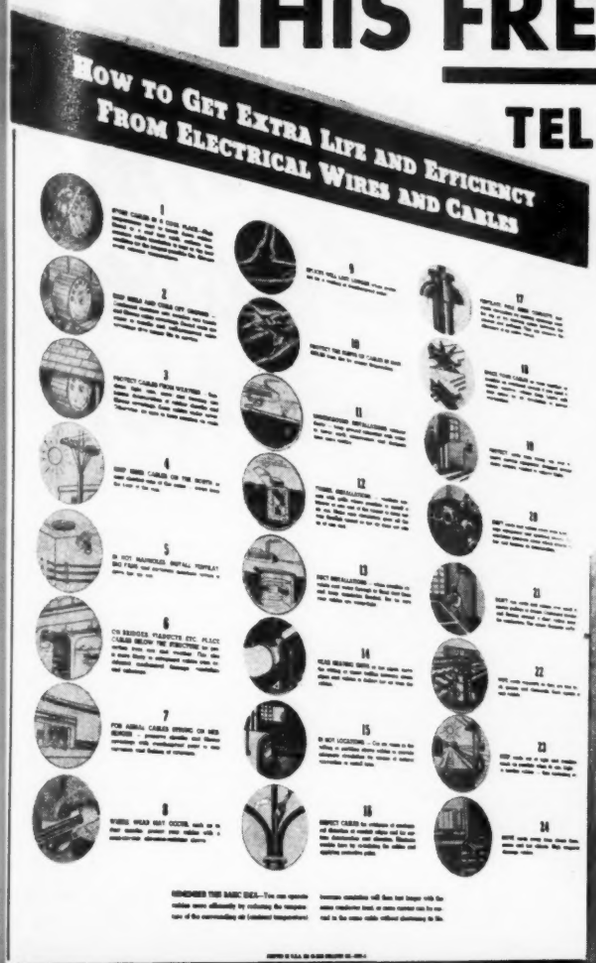
912-99 North Fourth Street, Columbus, Ohio

Sales Offices: Baltimore, Birmingham, Boston, Buffalo, Chicago, Cleveland, Cincinnati, Detroit, Denver, Harlan, Houston, Huntington, Milwaukee, New York, Philadelphia, Pittsburgh, Scranton, St. Louis, Salt Lake City

Service Stations: Pittsburgh, Harlan, Ky., Birmingham, St. Louis, Logan-Beckley, W. Va., Scranton

THIS FREE WALL CHART

TELLS HOW TO PROLONG CABLE LIFE


How to Get Extra Life and Efficiency From Electrical Wires and Cables
THE OKONITE COMPANY
PASSAIC NEW JERSEY
OFFICES IN PRINCIPAL CITIES

This 22" x 33" wall chart tells how to make electrical wires and cables last longer. It also tells how to improve circuit capacities and efficiencies. It shows how cable life may frequently be prolonged by merely moving cables from a hot to a cool location, or by installing a fan or simple baffle.

The chart also has valuable suggestions on the maintenance of wire and cable — a "*must*" in your program, when new equipment is difficult or impossible to obtain and reliable electrical service is of utmost importance.

Send for a copy today and put it to work for you.... The Okonite Company, Passaic, New Jersey, and Hazard Insulated Wire Works Division.

This chart tells you:
• How to increase current loadings (nearly half the suggestions are on this subject).
• How to protect joints.
• How to prevent damage to cables.
• How to care for portable cords.
• How to store insulated wire.

3385

ARMY E NAVY

HAZARD Insulated Wires and Cables

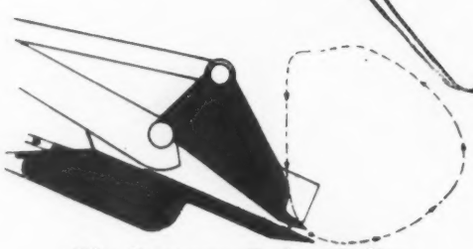
Why YOU Need the "AUTOMAT" Shovel Action

★We realize, of course, that coal operators are primarily interested in a mechanical loader because of its capacity to load the most coal at the lowest cost. The Whaley "Automat" meets these primary demands perfectly, but there are other essential requirements for complete satisfactory operation.

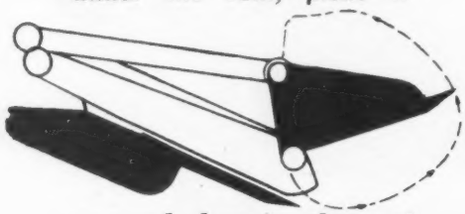
No other loading machine can give you the "Automat" Shovel Action loading head with its three distinct advantages—safety, at all times, lowest power cost per ton loaded, and minimum breakage of coal.

The "Automat" is safer because of the vertical plane loading action of shovel mechanism. No sudden side-kicking of machine and consequently no danger of crushing men or knocking out timbers. Only one 25 H.P. motor is required to operate the "Automat." This is due largely to the smooth mechanical action of shovel. No dragging, or unnecessary wear on loading head. The "Automat" Shovel action loads the coal just as it finds it. No crushing or breaking of coal while loading.

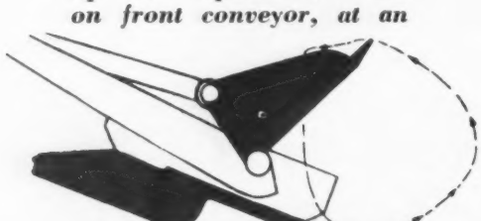
These features are all tangible advantages, worthy of serious consideration because they contribute much to the "Automat's" primary job of loading the most coal at the lowest overall cost. Myers-Whaley Company, Knoxville, Tennessee.



The "Automat" shovel slips under the coal, picks it



up and deposits the coal on front conveyor, at an



average rate of 3 tons per minute, maximum 7 tons.

MYERS-WHALEY

Mechanical Loaders Exclusively For Over 35 Years

PERMANENTLY SEALED

BY THE POWER OF WEDGE ACTION

20,000 LBS. EXPANSION PRESSURE "COLD-WELDS" O-B WEDGE BOND TERMINAL TO RAIL WEB

Unretouched photomicrograph of section indicated showing how the copper of the bond terminal flows around the steel rail web forming a corrosion-proof bead—20 DIA. ENLARGEMENT

O-B WEDGE BONDING SYSTEM - - -
Positive Mechanical and Electrical Joint
Installed with Few Simple Hammer Taps
Suitable for Universal Bonding

Ohio Brass
MANSFIELD, OHIO
Canadian Ohio Brass Co., Ltd., Niagara Falls, Ont.

KEEP BUYING WAR BONDS

WRITE FOR BOOKLET 764M

2377M

*NEUTRALIZATION

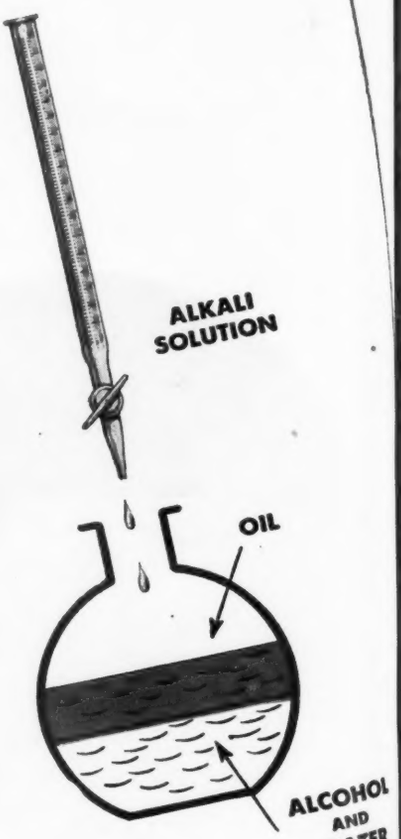
DEFINITION: The neutralization number is the weight in milligrams of the amount of potassium hydroxide (KOH) required to neutralize the acid constituents in one gram of oil.

NEUTRALIZATION TEST: Following a carefully prescribed procedure, a definite quantity of oil together with a mixture consisting of equal parts distilled water and alcohol are agitated thoroughly and heated to boiling. A phenolphthalein indicator is added and a solution of aqueous potassium hydroxide of definite strength is poured into the mixture in small increments and shaken vigorously each time. The first appearance of a sharp pink color throughout the alcohol water layer indicates the point of complete neutralization.

The number of milligrams of potassium hydroxide per gram of oil required to achieve this result is called the Neutralization Number.

SIGNIFICANCE: Corrosive mineral acids are sometimes used during the refining process of certain crudes. As a precaution against their presence in harmful proportions, it is customary to specify a maximum Neutralization Number of 0.10 for clear colored, straight mineral lubricating oils.

The Neutralization Number has no such significance in connection with unfiltered cylinder oils and black oils. These may contain larger amounts of harmless organic acids originating in the crude petroleum. High Neutralization Numbers do not imply corrosive acidity with compounded oils; i.e. mixtures of mineral oils and fatty oils. The latter oils are often inherently high in organic acidity.



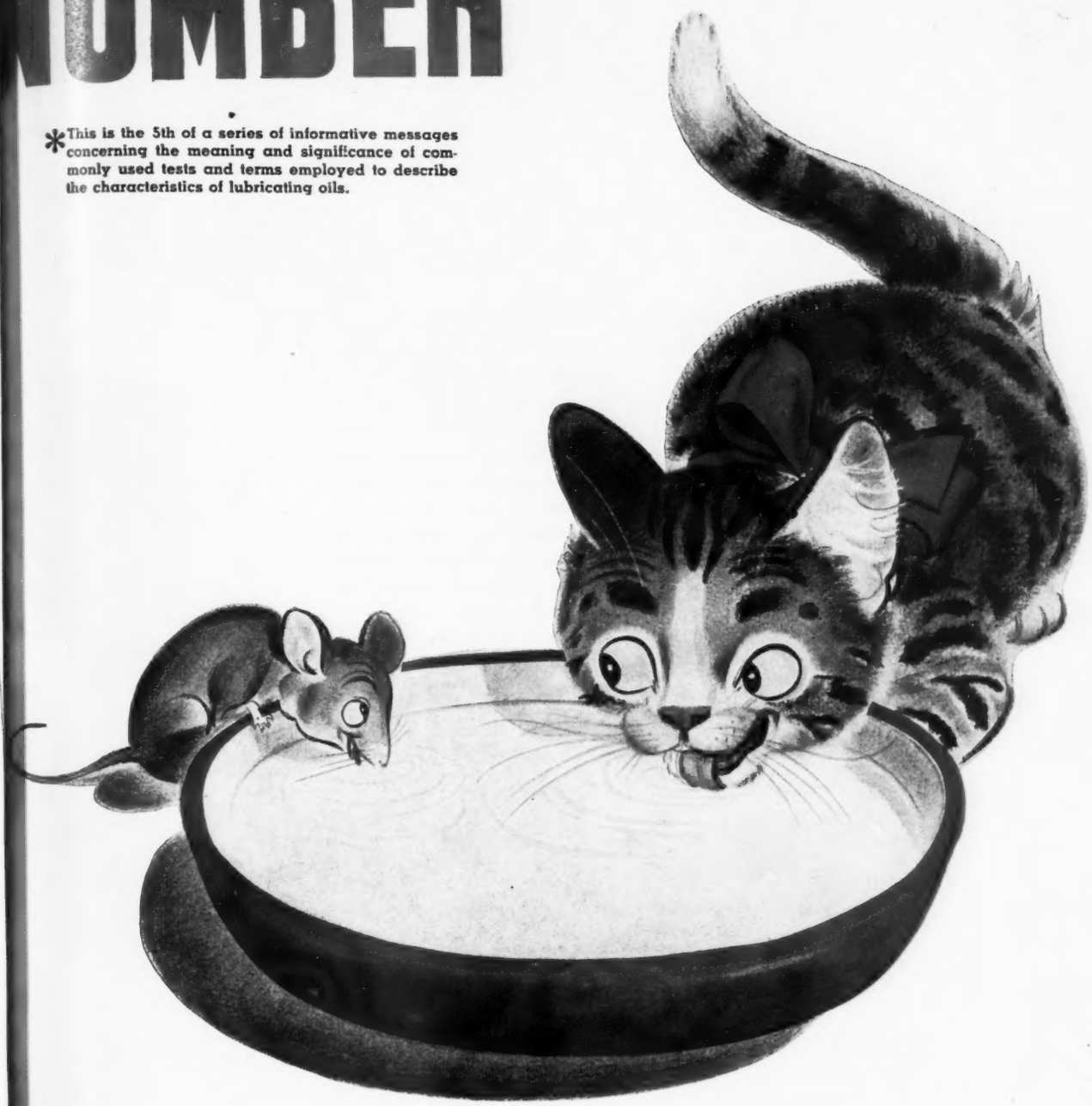
DRUMS! DRUMS! DRUMS!
War needs make it extremely important that empty drums be returned immediately.

SCIENTIFICALLY ENGINEERED FOR EVERY INDUSTRIAL USE

TYCOL

NUMBER

*This is the 5th of a series of informative messages concerning the meaning and significance of commonly used tests and terms employed to describe the characteristics of lubricating oils.



Tycol lubricants are manufactured in a comprehensive line so as to meet every specific operating requirement. Whether straight mineral or compounded, they are produced under rigid control to assure freedom from all harmful acidity.

Tide Water Engineers will recommend the Tycol lubricant best suited to your particular requirements.

TIDE WATER ASSOCIATED OIL COMPANY

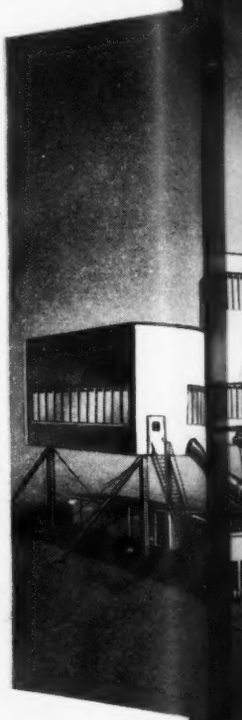
Eastern Division: 17 Battery Place, New York 4, N. Y. • *Principal Branch Offices:* Boston, Philadelphia, Pittsburgh, Charlotte, N. C.

MAKERS OF THE FAMOUS VEEDOL MOTOR OIL

INDUSTRIAL LUBRICANTS

YOUR STAR SALESMAN

Your preparation plant is your star salesman. If you are not equipped to supply the demand for prepared sizes you are at the mercy of the market. In war times you can sell all you can produce. But before the war, mines served an unwilling market, and that condition is bound to return after the war. With proper preparation of your product you can get a market now and stay in that market after the war is over. In a plant such as illustrated here, 600 tph of sized and washed coal are produced. The tipple is modernistic, efficient, and economical to operate. Two 300 tph McNally-Norton patented automatic washers clean 6″ x 0″ sizes. There will always be a demand for coal of this character. Such a plant . . .



WORKS TO WIN

when competition is keenest

When tonnage demands drop off, the mines equipped to deliver prepared coal find that selling is the least of their difficulties. When buyers are more demanding for coal of certain specifications, the mines equipped to meet specifications will continue to operate on full time. The fields of plastics and synthetics, such as rubber and fuel made by the hydrogenation process, offer new markets for coal. These require prepared coal.

Now is the time to plan for post-war markets. Our engineers will gladly go over your property with you, and from a preliminary survey submit suggestions on how you can keep your sales curve up with the aid of this new kind of star salesman.

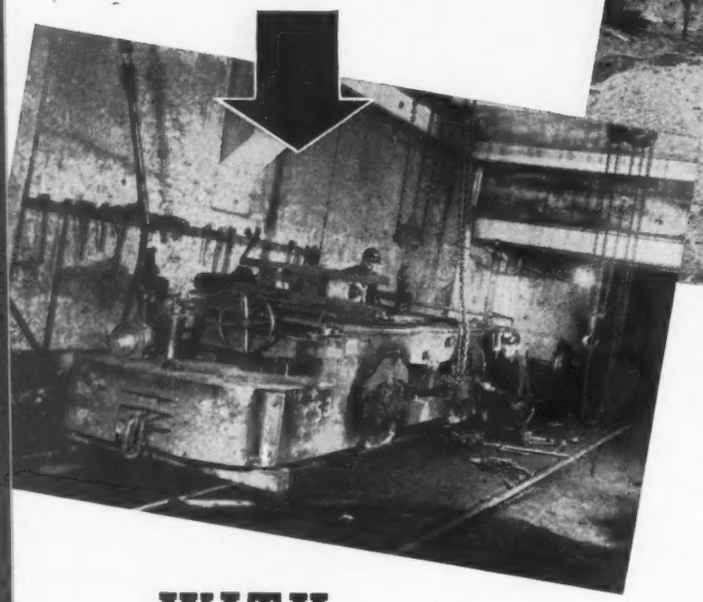
McNALLY PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNALLY PITTSBURG MANUFACTURING CORP.

Pittsburg, Kansas
307 N. Michigan Ave., Chicago 1, Ill.
Koppers Bldg., Pittsburgh 19, Penn.
Caixa Postal 1310
Rio de Janeiro, Brazil

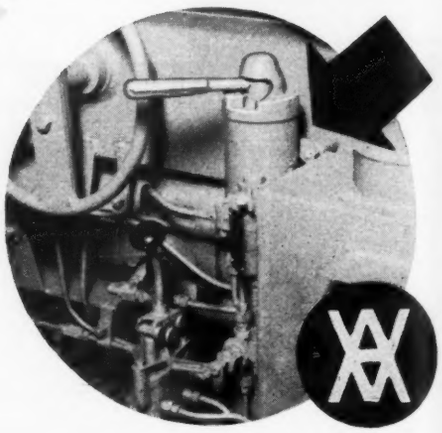
LESS OF THIS



MORE OF THIS

. . . WITH

WESTINGHOUSE *Hydraulic Brakes*



AVAILABILITY of small locomotives is increased when they are equipped with Westinghouse Hydraulic Brakes. They spend more productive time at the mine—less idle time in the shop.

The Hydraulic system provides power for braking that is responsive, adequate, and flexible. Manipulation is simple and effortless. A locomotive can be kept under control at all times without recourse to partially set hand brakes or motor "bucking". Abnormal wear on mechanical elements, and damaging shocks to electrical apparatus, are thus prevented. Maintenance expense is drastically reduced, time out for repairs minimized, serviceability of equipment enhanced.

The Westinghouse Hydraulic Brake is a simple, compact system, easily installed on new or old locomotives, where space limitations preclude use of Air Brakes.

Pressure development with the Hydraulic Brake is directly proportional to the degree of operating handle movement. Any required braking intensity can be attained quickly and accurately . . . Ample power and flexible control facilitate spotting of cars at loaders, and permit heavy haulage down grade at time-saving speeds, safely. » »

WESTINGHOUSE AIR BRAKE CO.

Industrial Division **PITTSBURGH, PA.**

"PASS THE AMMUNITION"

NATIONAL

An Industrial Ammunition

Made in an

AMERICAN PLANT

with

AMERICAN MATERIALS

by

AMERICAN WORKMEN

for

AMERICAN MINERS

NOT LIVING ON OUR REPUTATION
BUT BUILDING IT

NATIONAL POWDER COMPANY

ELDRED (McKean County) PENNA.

Manufacturers of High Explosives
for all Industrial Purposes

Which TYPE *of* V-Belt
Best Fits *YOUR* Need?

– *Special* **Synthetic** *Belts?*

– **Steel Cable** *Belts?*

– **Rayon-Cord** *Belts?*

– **Standard** *Vulco Ropes?*

Phone Your Gates Field Engineer–
He Will Tell You!

If you have a drive on which a V-belt of special type may be required for greatest service efficiency, you will almost certainly find that Gates has long been building a V-belt precisely engineered to fit your needs.

In some installations, a V-belt whose tension member is composed of rayon cords will have advantages over the standard cotton cord construction. Gates has been building rayon-cord belts since 1939.

Again, Gates engineers have found that a belt built with flexible steel cables as the tension member is sometimes most economical despite its higher initial cost—and Gates has been building flexible steel cable V-belts since 1935.

For five years, the Gates synthetic rubber belt has been piling up amazing service records in large industrial plants all over the United States. Under severe conditions of heat and oil, the Gates special synthetic belt actually outwears any natural rubber belt by as much as 230%.

It might seem that it would be some trouble to determine whether a synthetic-rayon, a synthetic-steel-cable, or a standard Gates Vulco Rope would be most efficient and economical for your particular application. Actually, this involves no more than picking up your phone.

There is a Gates engineering office in every large industrial center. The Gates field engineer who consults you in answer to your phone call is thoroughly competent to analyze any drive problem you may have. He is completely informed on the nature and advantages of every type of belt. He will always recommend the practice that will be most efficient and economical for you.

438

THE GATES RUBBER COMPANY
Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

CHICAGO, ILL. 549 West Washington
NEW YORK CITY 215-219 Fourth Avenue
ATLANTA, GA. 738 C. & S. National Bank Building
LOS ANGELES, CAL. 2240 East Washington Boulevard
DENVER, COLO. 999 South Broadway
DALLAS, TEXAS 2213 Griffin Street
PORTLAND, ORE. 333 N. W. 5th Avenue
SAN FRANCISCO, CAL. 1090 Bryant Street

Old Poker-Face is Losing Caste

BUYERS who imitate the clam and play their thoughts "close to the chest" never were very popular. They are less so now. "Not interested" is a dangerous reply in these days of new ideas, new ingredients and new methods.

Wise buyers lay their cards on the table nowadays. They talk their problems and hunt new ideas to rub against their own. They are seeking men whose minds will click with theirs to produce a 2 plus 2 equals 5 result. Synergistic thinking is the name for it and it is a growing habit in the mining industry.

So many new discoveries and methods are coming out of laboratory and field experience that it takes synergistic thinking to make full use of their possibilities.

Choosing the right permissible for the job is a case in point. The old days of "the bigger the lump the better" are on the wane. Nowadays explosives men and buyers get together to find exactly the right grade to match operating conditions and market demands. The story has changed to, "Get the job done right, at the lowest cost, with the greatest conservation of men and machines to speed Victory and the Peace."

The very existence of 19 grades of Atlas permissible explosives is a practical invitation to synergistic thinking with Atlas on the part of operating men who may profit by "Better Blasting" applied to their job.

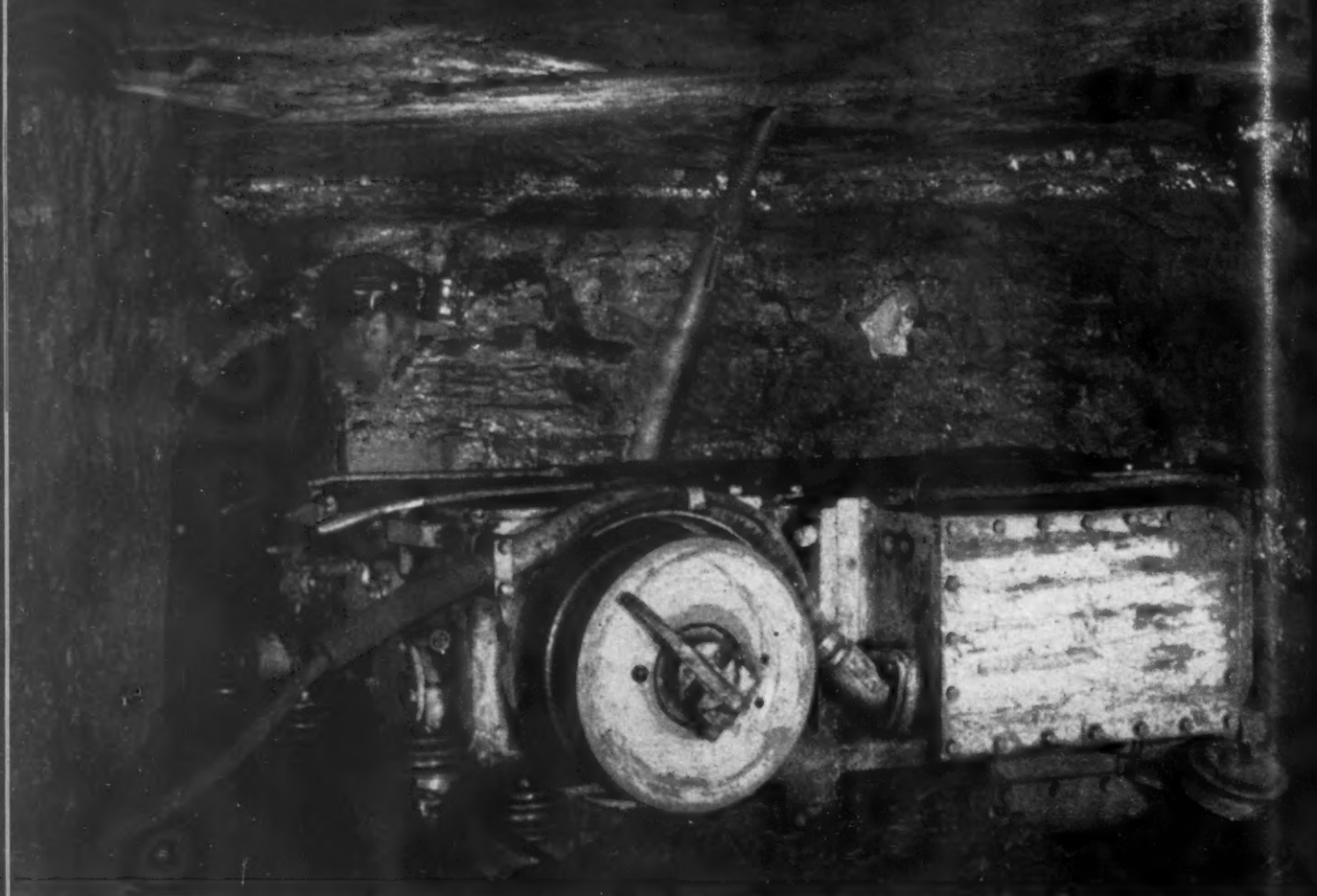
We will welcome the opportunity to practice synergism with you.

ATLAS EXPLOSIVES
"Everything for Blasting"

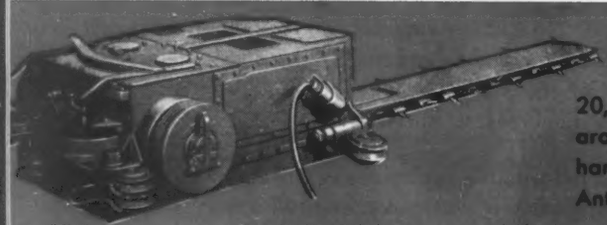
CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • Offices in principal cities • Cable Address—Atpowco

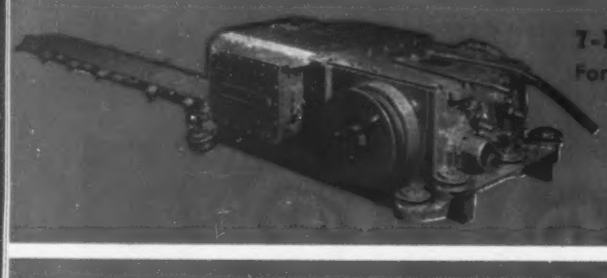
JUST ONE JOB



SPEEDY SULLIVAN COAL CUTTERS FOR EVERY MINING METHOD



11-B Conveyer Type Shortwall Cutter—Only 21 inches high cutting a six-inch kerf yet it delivers cuttings to the rear. 58 inches long 20, 35, or 50 h.p. A tough little cutter that's speedy in operation, easy to mo around and position. Fool proof and convenient operation. Simple contro handled from rear or side. Rugged, accessible construction. Splash lubricatio Anti-friction bearings, alloy steel gears and pinions. Big-load-starting moto



7-B Shortwall Cutter—A fast cutter that stays well ahead of the loade For modern mechanized mining. Handles up to a 9-foot bar. Two-directio operation. Variable feed control for hard cutting or worn bits. Easy t handle. Durable—has splash lubrication, alloy steel gears and pinions 50 h.p. slow speed motor. Superior, through and through constructio makes 7-B stay underground longer. All parts easily accessible.

7-AU Universal Track Cutter—Has a 50% longe reach yet it is the fastest and most flexible track cutter. The Sullivan 7-AU will cu in top, center or bottom, make center shears, angle shears, rib shears or slab cu and in addition has bar tilt and roll. If mining conditions permit, will cut wider cou for greater tonnage per cut. May be completely controlled from either side of mach

Sullivan 7-AU is licensed under patents to E. C. Morgan, patents numbers 170691—170692—1707132—1983325—19

FOR THE OPERATOR TODAY!

COAL IS BASIC TO VICTORY. Coal is electric power, steel, ships, tanks, airplanes. Any operator who knows *that* knows he has just one job now . . . to produce *more coal faster than ever before.* But coal can't be mined faster than it can be cut. Install Sullivan Coal Cutters and even if you have to use bigger drilling, loading and haulage crews to keep up with them, production will increase and costs will shrink. Cold-blooded cost and production analysis in every coal-producing region shows Sullivan Cutters are the fastest, the most economical, the simplest to operate, the easiest to "keep underground," and *they stay there the longest.* Let a Sullivan representative *prove* it. SULLIVAN MACHINERY COMPANY, *Executive Offices:* Michigan City, Ind. *In Canada:* Canadian Sullivan Machinery Co., Ltd., Dundas, Ont.

ARMY E NAVY

SULLIVAN

Coal Mining Machines • Scraper Haulers • Rock Loaders • Hoists
Car Pullers • Air Compressors • Coal Drills • Rock Drills • Cutter Bit
Sharpeners and Heaters • Core Drills and Core Drill Contracting

★ *Mining Machines for Every Mining Method* ★

Sales offices in:

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Butte, Mont.
Chicago, Ill.
Dallas, Texas
Denver, Colo.
El Paso, Texas
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San Francisco, Calif.
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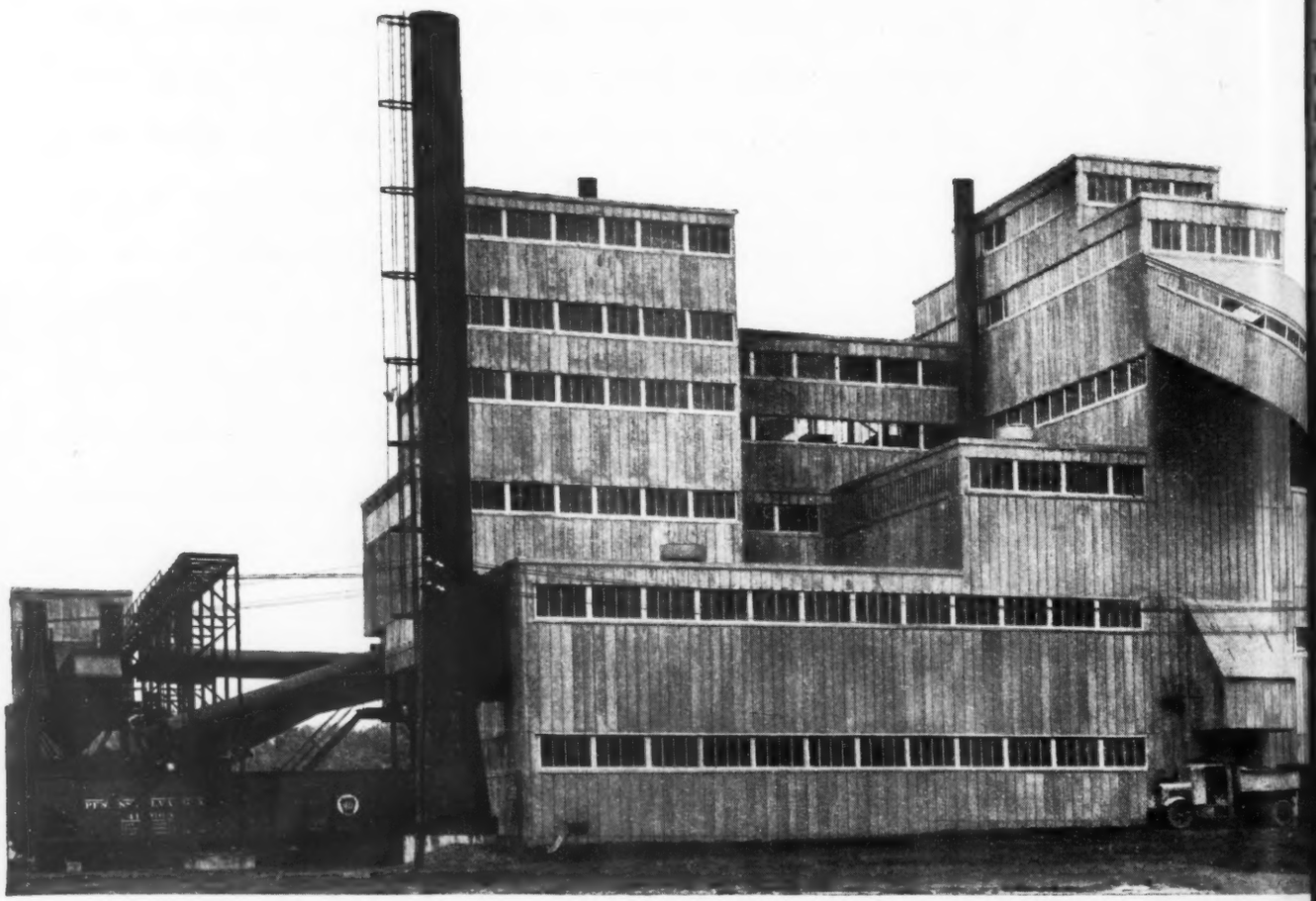
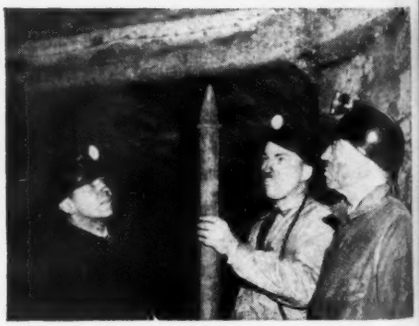
Scranton, Pa.
St. Louis, Mo.
Johannesburg, So. Africa
Sydney, Australia
Grantham Lincs, England

They darned a rip a quarter of a mile long to keep coal moving to war industries



1 Here is the slope belt that carries coal from underground operations to the top of the coal preparation plant. The belt is 4 ft. wide and 1450 ft. long... more than a quarter of a mile. The entire coal output of the mine is carried on this extra strong belt.

2 The accident occurred just behind this dust screen. The firmly wedged, sharpened jack pipe acted as a perfect cutting tool... aided by the 250-h.p. drive of the belt motor. No belt is made strong enough to withstand such punishment.



3 This is the spear-shaped head of the 8-foot, heavy steel jack pipe that fell into the rotary coal dump, and pierced the belt and the steel decking. Its flange became wedged so firmly that the jack pipe had to be cut free with acetylene torches.

UNITED STATES

This million dollar coal preparation plant is one of the nits that is enabling the coal mining industry to increase s output approximately ten per cent this year. Here, oal is washed, graded and prepared for shipment.

It's a tremendous plant . . . but its uninterrupted peration depends on the smooth functioning of the onveyor belt that carries coal from far below the sur- ace of the earth to the top of the plant itself where rading and cleaning processes start.

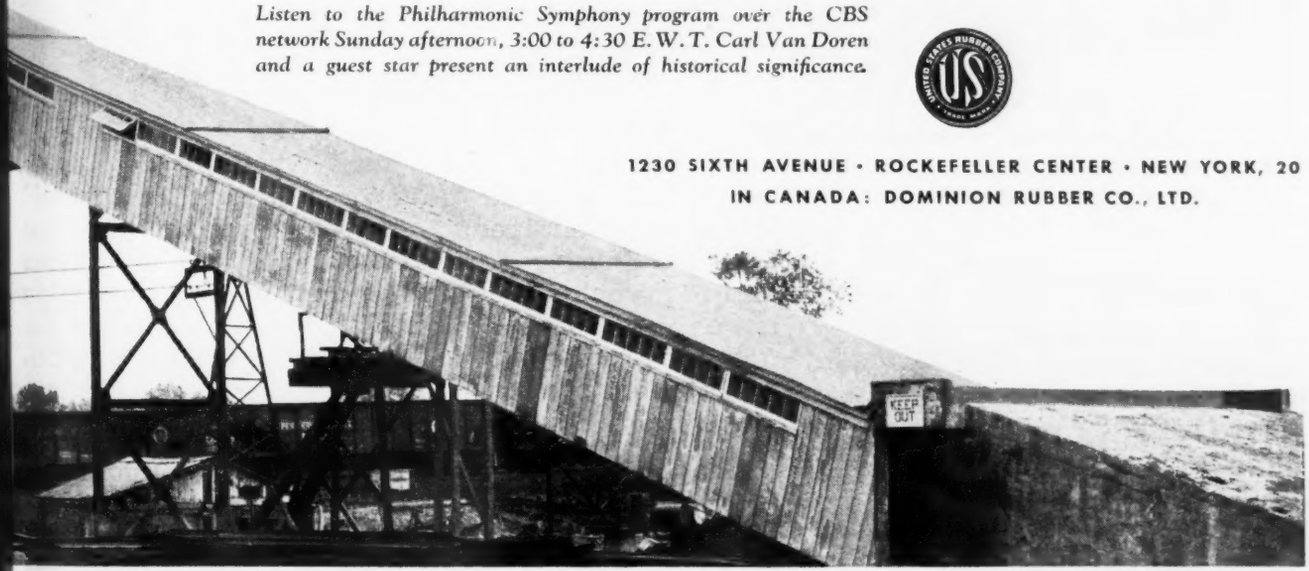
Not long ago an unusual accident occurred which ipped more than 1400 feet of this extra strong belt. A newly sharpened steel jack pipe hurtled down with a oad of coal. It pierced the belt and the steel decking eneath it . . . became firmly wedged between this sheet f steel and the coal-crushing rolls. But the 250-horse- ower belt-drive motor droned on . . . drove the belt ast this perfect cutting tool. When the damage was iscovered and the belt stopped . . . plant operations came to a standstill. Shipments of fuel, vital to America's war industries and railroads, were halted.

Immediately the plant superintendent telephoned United States Rubber Company. *Would the plant have to shut down until a new belt was built, shipped and installed? Or . . . could it be repaired?* They said it could . . . made suggestions which were promptly carried out . . . 4600 rip plates required to do the job were rounded up by the local distributor of industrial supplies. The United States Rubber Company representative went to the plant . . . stayed on the job continuously until it was completed.

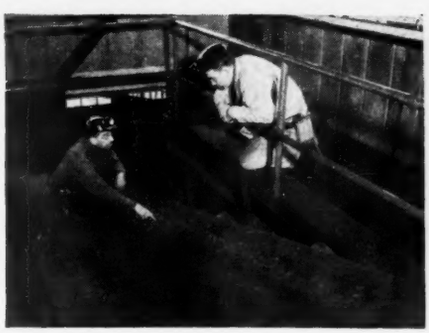
Twenty-five and one-half working hours later the plant was in full swing again. Coal flowed steadily from the mine. The quarter-mile rip had been darned . . . valuable rubber and equipment conserved . . . invaluable time gained.

Listen to the Philharmonic Symphony program over the CBS network Sunday afternoon, 3:00 to 4:30 E. W. T. Carl Van Doren and a guest star present an interlude of historical significance.

1230 SIXTH AVENUE · ROCKEFELLER CENTER · NEW YORK, 20
IN CANADA: DOMINION RUBBER CO., LTD.



4 The belt was repaired by bolting rip plates of thin steel through it. More than 4600 were used . . . approximately a ton of steel. The local distributor furnished the first supply; and arranged emergency shipments from factory stock.

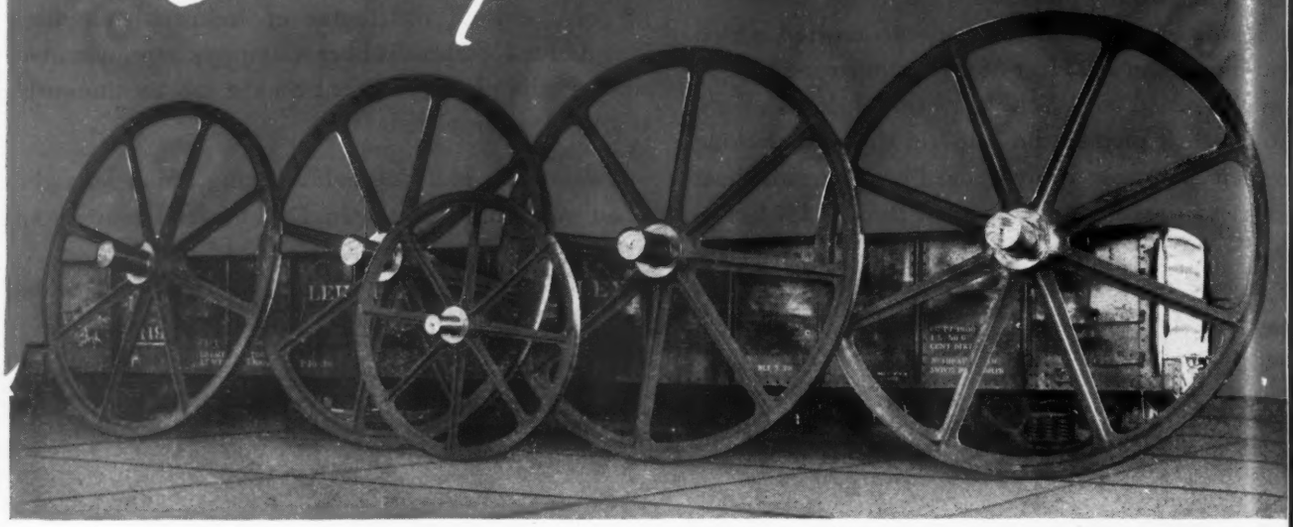


5 After the belt was repaired, it looked like this. The long rip has been darned successfully. The picture was taken after a test run of the belt had been completed satisfactorily and operations were ready to go into full swing again.

6 The plant is now working at top speed. Valuable time was saved . . . and very valuable rubber and equipment conserved. United States Rubber Company representatives and engineers are always on call . . . ready to step into the breach.

S RUBBER COMPANY

"ALLCASTEEL" SHEAVES *are always* "TAILOR MADE"



Vulcan "Allcasteel" Sheaves for one of the world's largest mining companies. The four large Sheaves are each 14 ft. pitch diameter, grooved for 1⅞" rope. The smaller Sheave is 9 ft. in diameter, grooved for 1⅛" rope.

HEAVY-DUTY ELECTRIC HOISTS
SELF-CONTAINED HOISTS
SCRAPER HOISTS
CAR-SPOTTING HOISTS
SHEAVES, PULLEYS, ETC.
SHAKING-CHUTE CONVEYORS
CHAIN CONVEYORS
CAGES, SKIPS, GUNBOATS
STEAM LOCOMOTIVES
ELECTRIC LOCOMOTIVES
DIESEL AND GASOLINE LOCOMOTIVES, GEARED, HYDRAULIC AND ELECTRIC DRIVE
LOAD-CARRYING LARRIES
ROTARY KILNS, COOLERS AND DRYERS
ROASTERS, CALCINERS, RETORTS, ETC.
BALL, ROD AND TUBE MILLS
BRIQUETTING MACHINES, FOR COAL, ORE, FLUE-DUST, ETC.

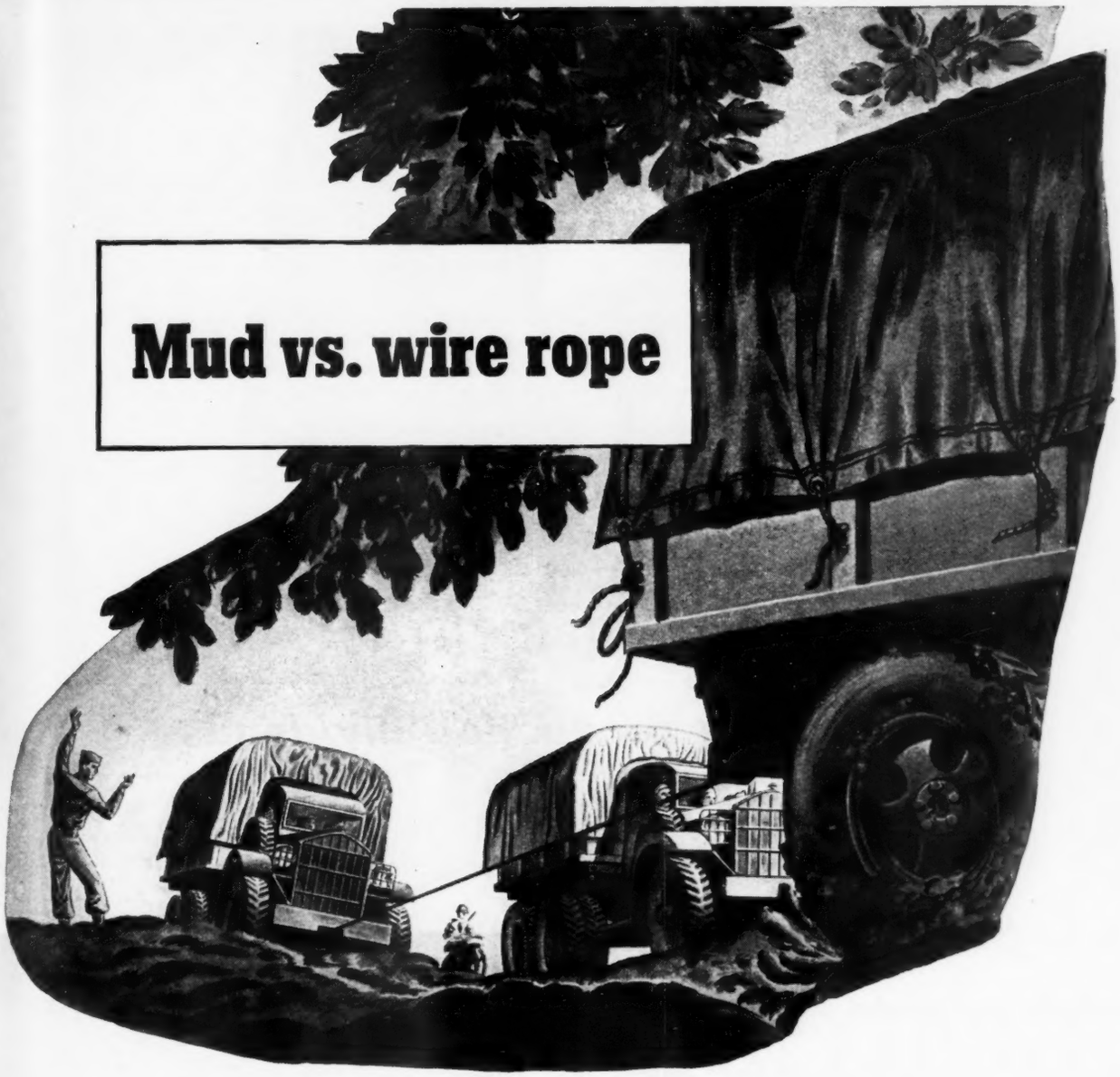
Before entering your order for a Vulcan "Allcasteel" Sheave, our engineers will want to know all of the essential facts regarding your hoisting conditions and requirements. From this data we will determine not only the proper pitch diameter, hub dimensions and size of rope groove, but also the correct distribution of metal, throughout the one-piece steel casting, to assure safe operation with minimum weight.

Perfect alignment is assured by accurate machining AFTER heat-treatment, but the finished surfaces are still so hard that the shape of the groove has never, to our knowledge, been noticeably affected by rope wear—even after twenty years of severe service.

Widely used, for nearly a quarter of a century, by large mining companies throughout the United States and many other countries, Vulcan "Allcasteel" Sheaves have thoroughly demonstrated their superiority for every type of heavy-duty service. Available for either vertical or horizontal mounting; with either plain or anti-friction bearings. Details on request.

VULCAN IRON WORKS
ESTABLISHED 1849

VULCAN
IRON WORKS
NEW YORK OFFICE
50 CHURCH STREET
WILKES BARRE • PA •



Mud vs. wire rope

We can't stop the rains, but we *can* provide a means for pulling stalled jeeps, trucks and tanks out of the clutches of that obstinate and gluey old campaigner, General Mud.

Bethlehem's wire rope mill is producing many thousands of emergency winch cables, carried as standard equipment on trucks and tanks. We make up these cables complete, with fittings and hooks all ready to be used. Millions of feet of Bethlehem wire rope have already gone into this service.

Bethlehem Manufactures Wire Rope for all Purposes

GULF LUBRICATION

is paying production dividends

in hundreds of mines

The quality lubricants and application methods recommended by Gulf Service Engineers cut wear and mechanical delays to a minimum, help keep equipment producing at top wartime speed and efficiency.

By reducing wear and warding off production-jamming mechanical troubles, Gulf Lubrication has accounted for substantial increases in output in many mines. Here's a typical case:

"The main guides of our shaker screens were being worn out in a very short time because of faulty lubrication," says a mine superintendent. "With a change to Gulf lubricants and with proper application as recommended by a Gulf Service Engineer, we get completely trouble-free service from this equipment."

Your mine, too, can benefit from the recommendations and helpful counsel of a Gulf Lubrication Service Engineer. Drawing on his wide experience with the lubrication of all types of coal mining equipment, he will cooperate with you to install the kind of lubrication practice that means full capacity equipment performance and maximum protection against excessive wear and resulting mechanical troubles.

The services of a Gulf Engineer—and the Gulf line of more than 400 quality lubricants—are quickly available to you through 1200 warehouses located in 30 states from Maine to New Mexico. Write or 'phone your nearest Gulf office today.

GULF OIL CORPORATION · GULF REFINING COMPANY
GULF BUILDING · PITTSBURGH, PENNSYLVANIA

GULF INDUSTRIAL LUBRICATION

MEMO TO: J.R.T.
Here's another case of lost time and tonnage due to faulty inspection. You wanted these called to your attention
Bronson
Superintendent

TROUBLE REPORT

Gathering locomotive at #8 entry dropped No. 2 motor at main line. Locomotive derailed and had both tracks tied-up for one hour. Cost—100 man hours and 500 tons coal. Cause—motor dropped due to backing-off of castle retaining nut. Cotter pin would have been detected during scheduled inspection.

PROPER INSPECTION COULD HAVE PREVENTED IT!

FRAMES AND BUMPERS

WEEKLY
MONTHLY
OVERHAUL

TIME SAVER

HERE'S A PRACTICAL WAY TO

STOP SUCH FAILURES

Before costly failures like this catch up with you—do this! Insist on a regular system of locomotive inspection by your maintenance men.

To help you put the proper information in their hands Westinghouse has prepared a Time-Saver Inspection Manual. It shows *when* and *where* your mine locomotives need attention to keep them operating efficiently. It includes operating tips for motormen that will help them prevent trouble.

Put this practical inspection plan to work *now*—send for your copies of this manual. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

J-15082

THIS INSPECTION CHART . . . on Frames and Bumpers tells maintenance men how to prevent failures like that above. It's typical of the practical information contained in the Westinghouse Time-Saver Guide.

Send Today for as many copies as you need for your men. Write Dept. 7-N. Ask for Booklet B-3150.

Westinghouse
PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

MINE LOCOMOTIVES

A REVIEW —MAINTENANCE HINTS FOR JEFFREY MINING MACHINERY

Last October we began a series of four-page advertisements, each devised to help you get continuity of service and maximum production from your Jeffrey equipment . . with the least time out for repairs.

NOW . . we bring the most important part of these individual advertisements together in one review . . so that you may have the Maintenance Hints at your finger-tips . . in order to continue meeting war-production schedules—safely, swiftly and economically.

GENERAL INSTRUCTIONS FOR KEEPING YOUR JEFFREY MACHINES IN TOP NOTCH WORKING ORDER

Keep Equipment Clean—Blow out dirt with compressed air, if available, once or twice a week. Keep inside of motor and electrical enclosures clean. Cleanliness helps to reveal minor defects—permits correction before they result in breakdowns requiring major repairs.

Make Scheduled Inspections—See that all control contacts make good contact, that all electrical connections are tight, that resistors show no signs of burning, and that commutator and brushes are in good condition. Replace any arc barriers before completely burned through. Check bearings to ascertain that they are taking lubricant properly. Look over gearing for any irregular wear or misalignment that might reveal excessively worn or damaged bearing that should be replaced. Check cable reel for free operation — proper cable tension.

Lubricate at Regular Intervals — Follow factory lubrication recommendations carefully. Use proper kind and amount of lubricant and handle all lubricants and lubricating devices so that they do not become contaminated with foreign matter. Keep lubrication fittings in good shape.

Operate the Machine Properly—Follow factory instructions. Pause on each point of controller when starting motor. Do not overload.

PROPELLER FANS

Observe oil level in reservoir daily. Flush out bearings once every six months. Keep all bolts tight. Inspect drive regularly and maintain proper belt tension, if fan is belt driven.

Keep exposed parts well painted with corrosion-resisting paint at all times. Clean fan blades and straightener vanes once a year.

Keep blade adjustment in step with the mine, referring to Jeffrey fan performance curves for guidance.

BLOWERS

Turn grease cups once each day. Flush out bearings with oil once every six months.

Keep all bolts tight.

Keep exposed parts well painted with corrosion-resisting paint at all times.

THE JEFFREY MFG. CO.
912-99 N. FOURTH ST., COLUMBUS, OHIO

LOCOMOTIVES

Check, at scheduled intervals, adjustment of brake shoes and need for renewal, condition of brake rigging, and journal box guides. Inspect sanding equipment — see that sand runs freely from each spout and strikes rails properly.

Keep down the load hauled to capacity of locomotive. A few LESS CARS PER TRIP may haul MORE COAL PER SHIFT with much less maintenance. Properly loaded will use sand sparingly, only on occasional adverse track conditions.

LOADERS

Maintain proper adjustment for all chains. Renew chain guides when worn or broken. Keep brakes and clutches in proper adjustment—do not set clutches too tight. At least once a shift, clean out coal that may lodge in such places as to restrict free operation of controls or chains.

At frequent intervals, check hydraulic system for leaks. Use clean oil and do not get water into hydraulic system. Clean out screens and filters once a week. Keep oil level up in oil tank and transmission case.

Avoid pushing the loader up against a face of coal that is not shot properly. This not only loses time, but results in unnecessary wear and tear.

UNDERGROUND CONVEYORS

At least once a shift remove coal from under discharge end and around power unit. Check oil level in speed reducer periodically. Check coal conveying chain. See that all cotter pins are in place — all badly bent flights replaced. Check condition of roller drive chain and be sure that proper shear pins are used in shearing hub.

On belt conveyor, inspect condition of belt and all idlers. Repair minor injuries to belt — grease all idlers. Remove any accumulation of fines from around return idlers.

Do not exceed recommended maximum length and capacity. Periodic electrical readings at point of operation will provide a check on loading.

SHORTWALL CUTTERS

Keep cutter chain properly adjusted—not too tight. Keep friction controls for rope drums properly adjusted. Inspect disc type friction clutches periodically. Replenish or renew oil as often as necessary with recommended grade to insure free operation of clutches.

Do not run on resistance except for such speed control as may be required in tramming. Do not run with dull bits. Keep cuttings shovelled away from cutter chain.

HYDRAULIC CUTTERS

At frequent intervals inspect hydraulic system for leaks. Clean out screens and filters once a week. Keep oil level up in tank. Every 150 operating shifts — drain, flush with clean oil, and refill tank. Keep water and dirt out of hydraulic system. Check all drive chains for adjustment and wear. Keep cutter chain properly adjusted—not too tight.

Do not run on resistance except for such speed control as may be required in tramming. Do not cut with dull bits. Keep cuttings shovelled away from cutter chain. Keep accumulation of cuttings removed that may interfere with free operation of adjustments and controls.

DRILLS

Always stand drill up or hang it up when not in use, and lay it down only in a dry place. Moving parts exposed to dust should be occasionally lubricated with a light oil, not with grease. Remove rough spots on feed screws to avoid rapid wear of feed nuts. Release feed before releasing feed nut.

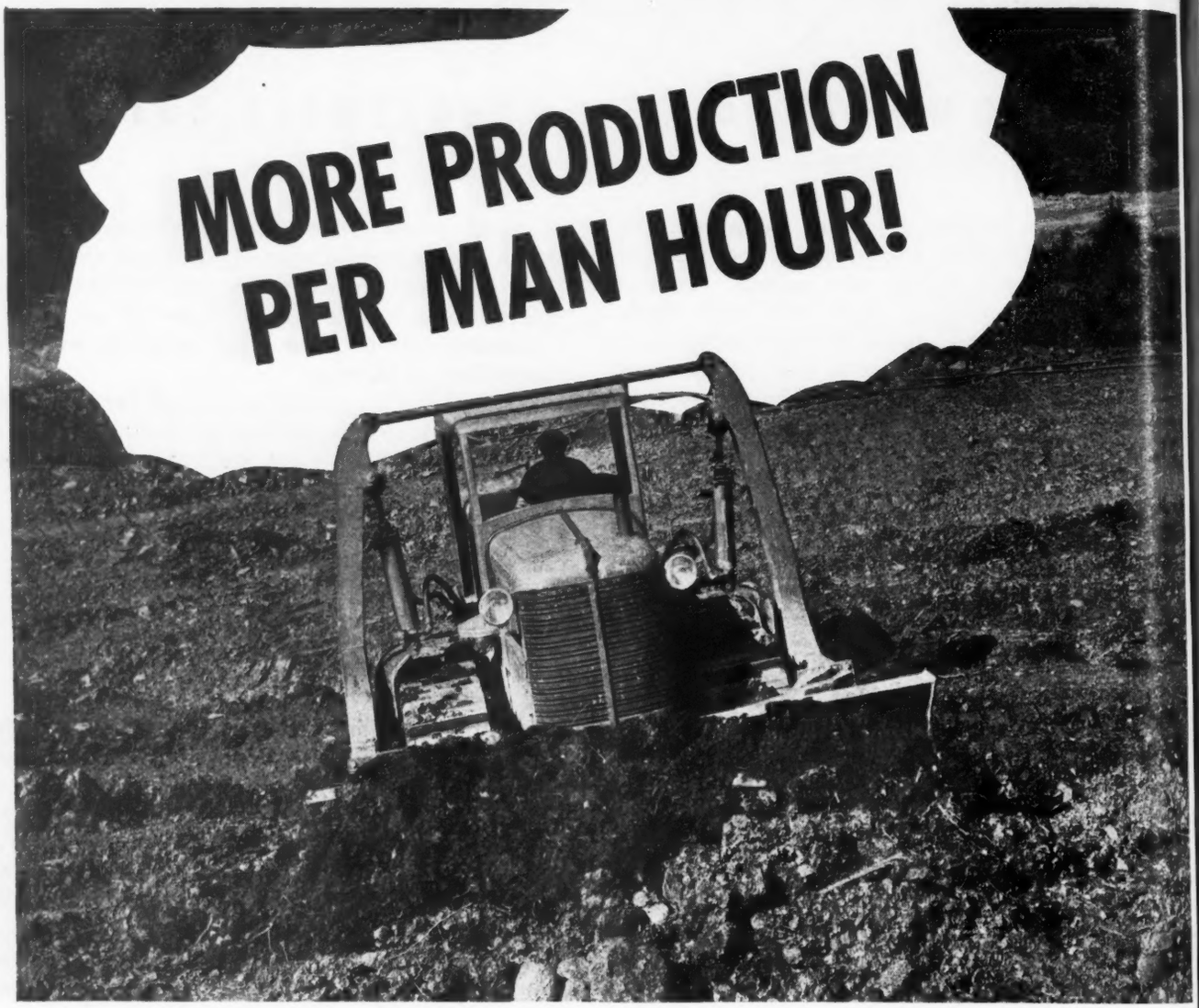
Use proper amount of oil in gear case — do not overfill.

See that friction clutch is not set too tight and do not allow drill to run very long with a slipping clutch. Do not drill with dull augers or bits.

Sales Offices: Baltimore, Birmingham, Boston, Buffalo, Chicago, Cleveland, Cincinnati, Detroit, Denver, Harlan, Houston, Huntington, Milwaukee, New York, Philadelphia, Pittsburgh, Scranton, St. Louis, Salt Lake City

Service Stations: Pittsburgh, Harlan, Ky., Birmingham, St. Louis, Logan-Beckley, W. Va., Scranton

MORE PRODUCTION PER MAN HOUR!



No man can work faster than his machine permits. This is especially true of tractor operators. To increase the tempo of stripping operations, road-building, cleaning coal beds, and other tractor jobs . . . give your operator a unit that "eats up" the work. Give him a 2-Cycle Diesel — the modern Diesel! There's no lost time going to work . . . no delay starting up after lunch periods. Starts like your car — INSTANTLY! Packs a real wallop, too, that carries it quickly through the toughest going — gets in there and lugs where ordinary units stall. Hangs on to overloads with steamlike tenacity — which means less gear-shifting! Maneuvers more rapidly . . . applies its power smoothly, without laboring. Keeps going 24 hours a day, if necessary, with a minimum of attention.

Fifteen per cent of our tractor production is released for essential civilian requirements. See your Allis-Chalmers dealer about the availability of equipment for your needs.

2-cycle THE MODERN DIESEL POWER

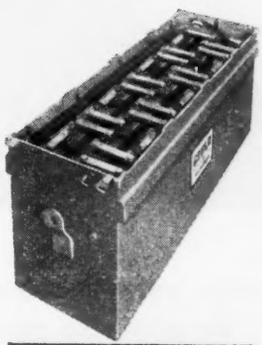
ALLIS-CHALMERS
TRACTOR DIVISION · MILWAUKEE · U. S. A.

GOULD DESIGNS, BUILDS AND INSTALLS THE RIGHT BATTERY TO DO YOUR JOB

• This is an age of specialization. Mammoth machines are designed to make a single part. Factories are built to produce just one article. Specialization pays big dividends in added efficiency and lower operating costs.

To get the best results every industrial storage battery must be designed to perform a particular task. Specialization in designing and manufacturing storage batteries to do the job has made the name Gould a tradition.

No matter what the battery problem, Gould field engineers bring expert knowledge to on-the-spot investigations. Gould factories translate their findings into the proper installation. Here is a specialized service at your command. We invite you to use it.



SPECIFY GOULD KATHANODE
The original spun glass battery tested by 20 years of actual service.

Rated Conservatively . . . *Goulds equal or exceed in capacity any battery of comparable size and cell structure.*

GOULD STORAGE BATTERY CORPORATION, DEPEW, NEW YORK

Builders of industrial batteries for every application. Sales and service offices in principal cities of the U. S. A

Factories at Depew, N. Y., North Bergen, N. J., Dallas, Atlanta, Chicago, St. Paul, Leavenworth, Los Angeles

FOR EXCELLENCE IN STORAGE BATTERY PRODUCTION AT DEPEW PLANT

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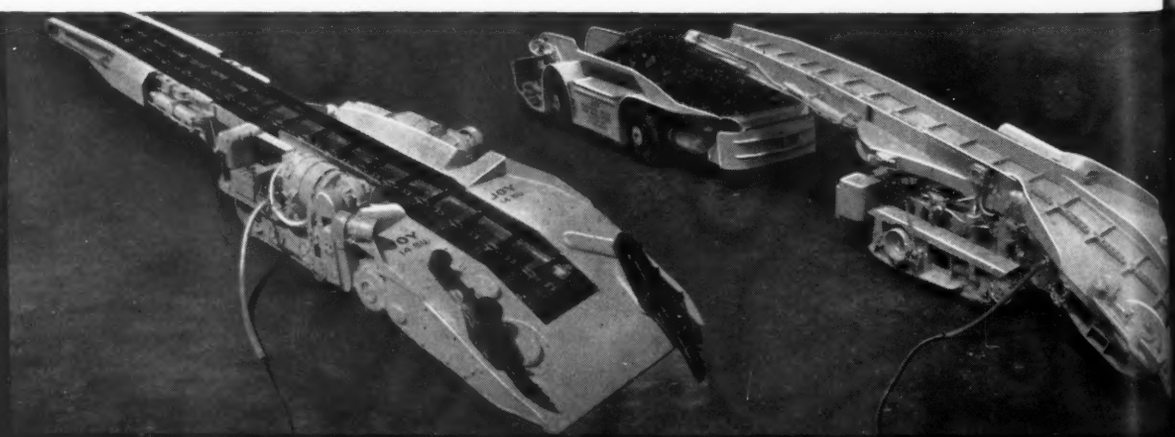

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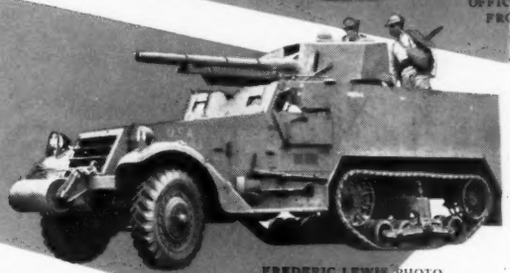

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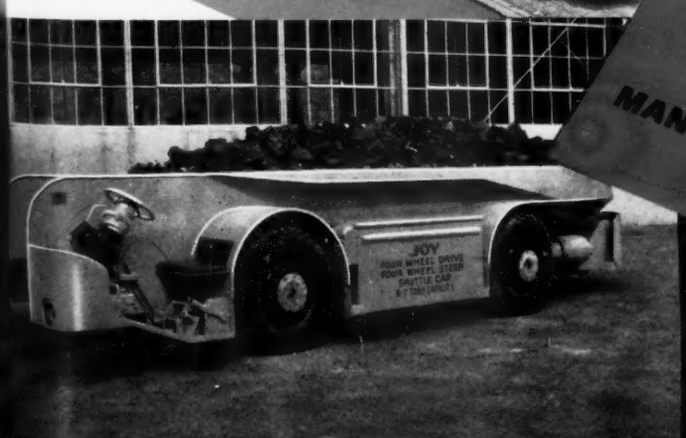

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COAL AGE

DEVOTED TO THE OPERATING, TECHNICAL AND BUSINESS PROBLEMS OF THE COAL-MINING INDUSTRY

AUGUST 1943

THE REAL ISSUE

THE GOVERNMENT still holds the coal mines, the War Labor Board order of June 18 still binds only the operators and John L. Lewis' Oct. 31 deadline still stands. That was the situation at the first of August—a situation that held little promise of an early end of federal operation. In fact, the trend was in the other direction, although some professed to see prospects of relief in the 60-day clause of the Connally-Smith War Labor Disputes Act. And there was the possibility of a new wage agreement. However, it was plain that Lewis had not receded an inch from his demand for a substantial wage increase—direct or disguised.

Only one thing could be cited as certain. That was that Secretary Ickes was organizing on the basis of indefinite continuation of operation. A growing list of lawyer appointees constituted perhaps the best evidence that control would be more rather than less—longer rather than shorter—barring an abrupt change in the way the wind is blowing. Meanwhile, a new low in official reluctance to come to grips with intransigeant labor leaders was registered July 9 when President Roosevelt asked what he should do if he requested Lewis to sign and Lewis refused. The President had the answer in the case of at least one employer, but labor leaders, even hostile ones, seemingly fall in a different category.

Small wonder that operators at times should feel that perhaps they should have joined forces with Lewis in wrecking the stabilization program. The pressure makes this feeling almost inevitable. It also tends to work in another direction—the direction of splitting the ranks of the operators. While one can sympathize with a desire to end by whatever means a situation with few elements of justice in it, operator splits seldom have benefited the industry in the long run. And there always is the possibility that the shirt—or at least the tail—might be given up for nothing. If government operation continues long enough, it might be difficult to bring it to an end even with the industry covered by new wage agreements, whether economic or not. That has been pointed out, and rightly so, as the outstanding hazard of long-continued government control.

Whatever the final outcome may be, the operators' course was real compliance with established procedure in the settlement of disputes and preservation of wartime stabilization measures. Operators have not relaxed their efforts to achieve maximum production, even when repaid by seizure. They have cooperated, as far as they have been permitted, in the solution of the various problems growing out of seizure and government operation.

Where, then, is the difficulty? It lies in official Washington's reluctance to face the real fact—the fact that Lewis' campaign to smash stabilization measures and make himself monarch of union labor is the fundamental reason for the present situation. The answer is clear. The mines must be returned without delay to their rightful owners, who have demonstrated their ability to get out the coal, and the administration must adopt a workable labor policy—a policy which will make union leaders equally responsible with employers for the furtherance of the war effort.

WORTH MONEY

GOOD PUBLIC RELATIONS are worth money. The fact that numerous industries and individual companies feel that they merit substantial expenditures is evidence of that fact, even if no other were available. Good relations achieve several very desirable goals. Better acceptance of product is one. Improved credit standing is another. Greater freedom from outside interference is a third. Coal recently has had reason to appreciate the worth of these things. It also has a start on a program for improving its standing in the eyes of the public. That program should be pushed with the utmost vigor.

A BEGINNING

HOLDING of public hearings on the O'Mahoney bill for building commercial-scale demonstration plants for producing liquid fuel from coal marks another milestone on the road to the broader opportunity for coal in the future—the opporunity so forcefully outlined by Secretary Ickes in "Coal's New Horizons" (April *Coal Age*). This is not the only new possibility for coal, however. There are others, not only in new uses but in stimulating satisfaction in existing uses. Research is the key, as always. The sooner it is done, the sooner the industry will cash in.

Coal Regulation

The Bituminous Coal Act of 1937 expires at midnight Aug. 23. "What next?" becomes the big question in the bituminous industry. Do the conditions which led up to the act still exist? How did the industry fare under it? What are the alternatives if a new regulatory measure fails to pass? To help answer these questions, *Coal Age* presents the following analysis of the reasons for regulation, how it has operated, and what the industry faces in the future.

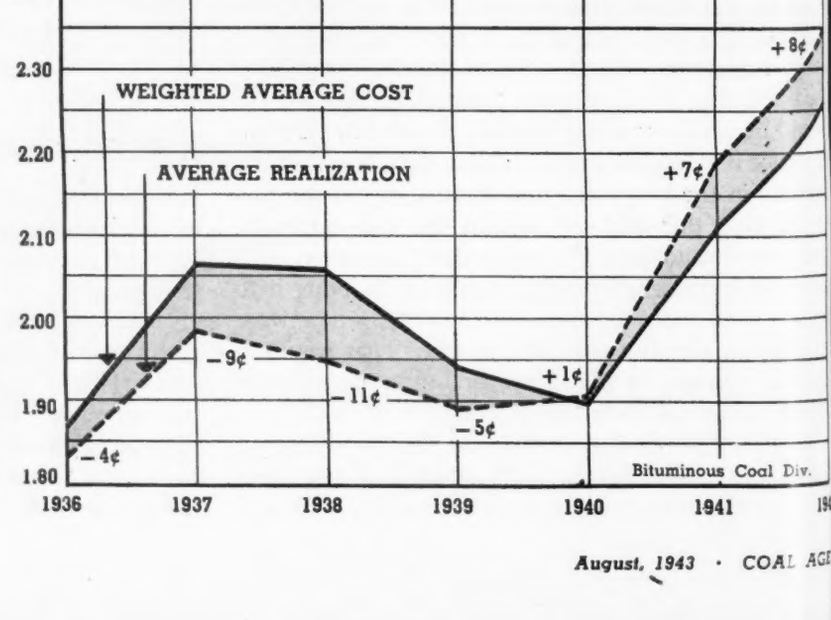
WAS THE Bituminous Coal Act of 1937 "an unnecessary cockeyed set-up," as one Congressman labeled it, or was it, in the words of its one-time administrator, "a practical instrument for the stabilization of the coal industry"? Both sides can and have cited the industry's scripture to their purpose. The views on failure of the Congress to renew the Coal Act range all the way from one sales head's casual "what of it" to another operator's funereal "we'll go right back to selling wages instead of coal."

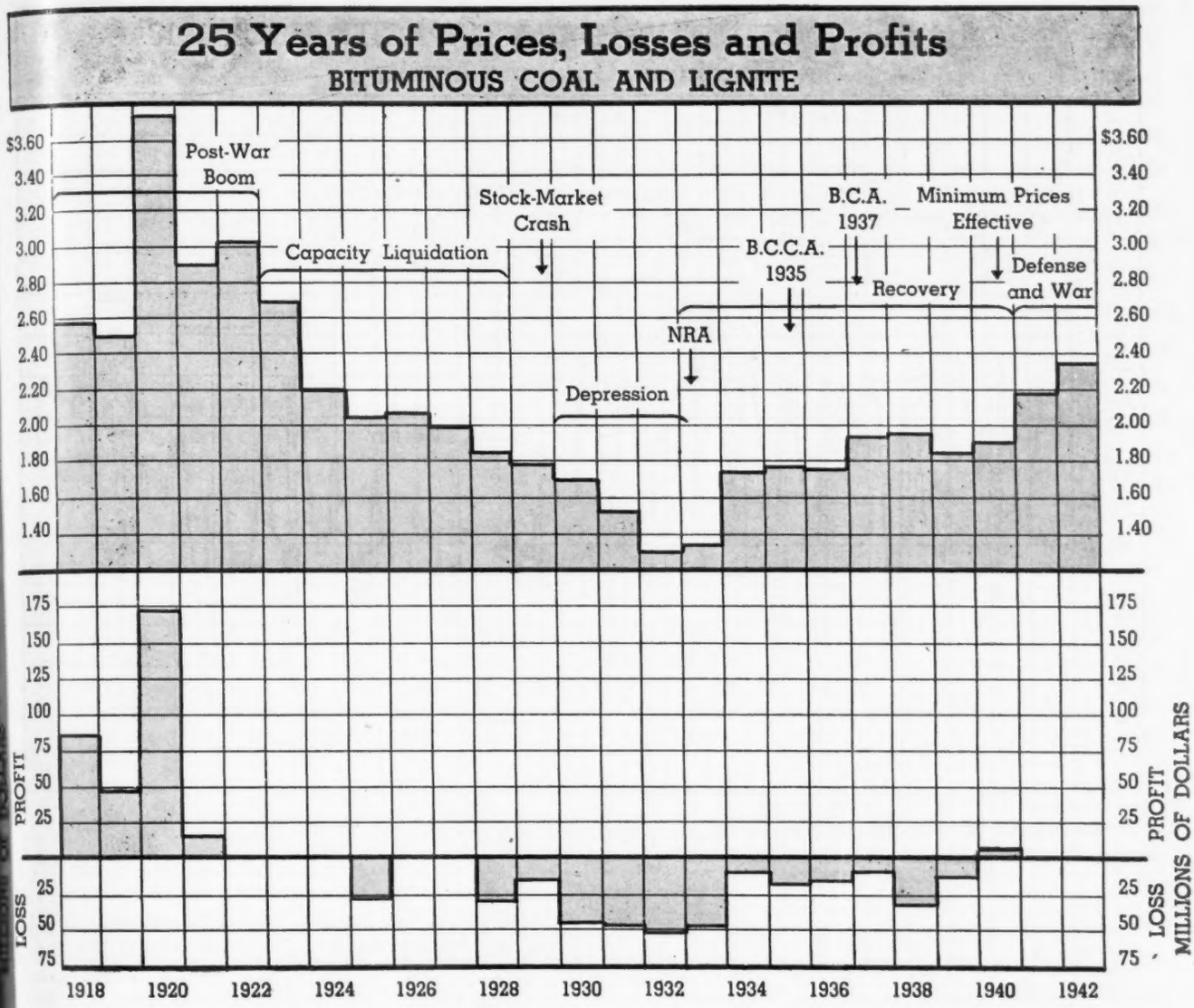
But whatever the conflict, the Coal Producers' Committee has listed operators representing 74 percent of the nation's total commercial soft-coal tonnage as not only in favor of extension of the old act, with amendments, but actively engaged in supporting enactment of bills now in both House and Senate for a new "Coal Conservation Act of 1943."

Supporters of the bill decry the argument that because of government operation of the mines and accelerated wartime demand, there is no immediate need for federal regulation of the type imposed by the act of 1937. They look fearfully to post-war readjustment and insist that regulation must be set up and operating when the war ends so that the industry will not take another nose-dive into red ink because of indiscriminate and unbridled competition for business in a shrinking market.

Why should the price structure in coal mining be subject to any more pressure (or regulation) than in any other industry? The answer is complex, but it involves at least these three major factors: the industry's internal organization, its capacity to pro-

Bituminous Cost and Realization Since 1936





duce, and the buying habits of its consumers. The latter two are interdependent, the normal buying habits of coal consumers making it necessary to maintain excess producing capacity to cope with peak and seasonal demand.

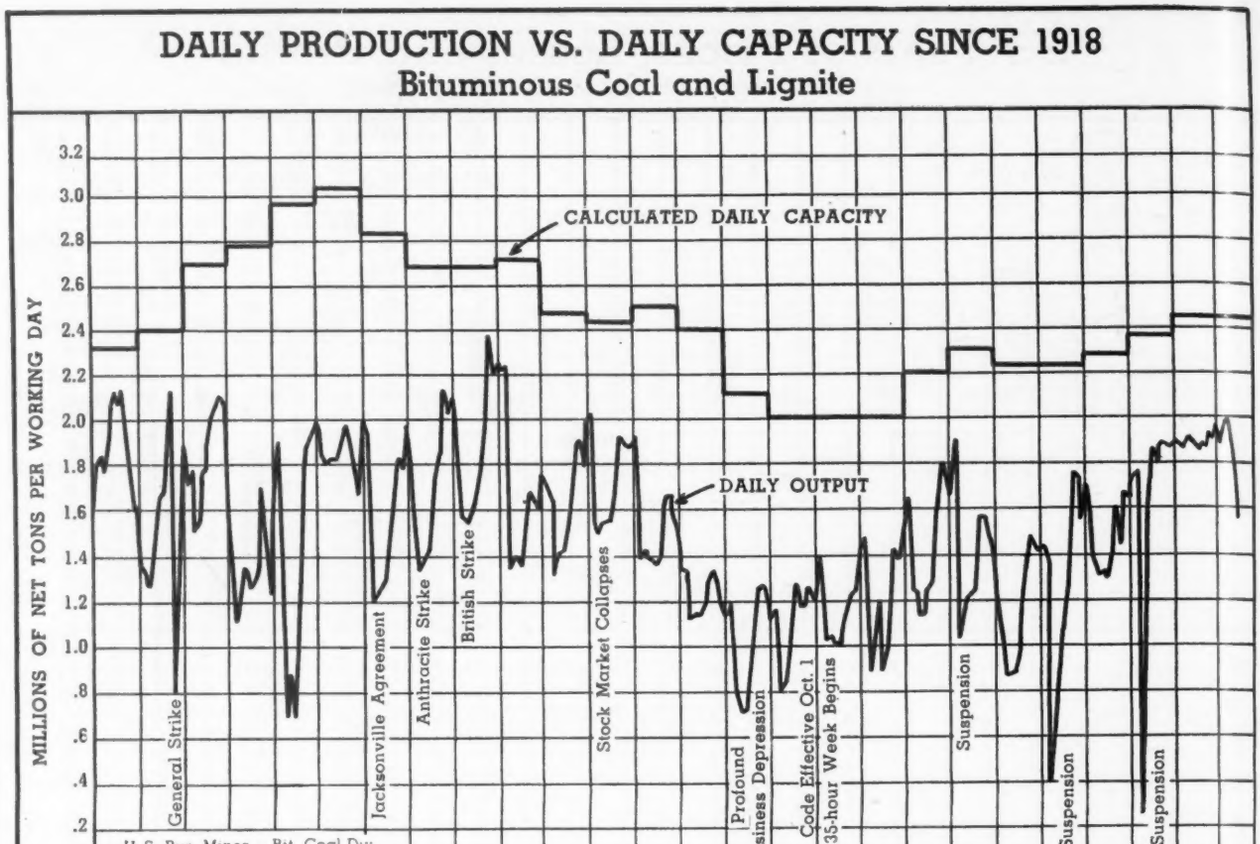
The question of regulation is not particularly new in coal mining. As far back as 1914, Illinois and Indiana operators were asking Washington to take official cognizance of their troubles. But up to the end of World War I the industry's difficulties were not unduly great in view of the fact that production was roughly doubling every decade. The First World War not only stimulated a major bulge in capacity, to be liquidated afterward, but set the stage for increased competition from other fuels and energies while at the same time initiating a trend toward increased efficiency in coal use that sharply reduced consumption by major consuming industries in succeeding years.

The depression which started with the stock market crash of 1929 threw the spotlight even more strongly on the need for some workable stabilization program. Out of the welter of legislative and other proposals the industry evolved the district sales agency plan. It had hardly started to function when the National Industrial Recovery Act sought to bind up the industry's wounds along with the rest of the nation's. The first Guffey Act, establishing the Bituminous Coal Commission, was enacted in 1935, and almost forthwith was held unconstitutional by the Supreme Court because of its labor provisions. Then came the second Guffey Act in 1937, the commission which it established becoming the Bituminous Coal Division under the Reorganization Act of 1939.

These steps were taken from the grim necessity of trying to save an industry which was rapidly showing signs of coming apart at the seams. But why this industry more than any other? Had not other industries, as basic and as big, managed to weather the Great Depression and get by with only a few injections from the government's financial hypodermic? Why, then, did coal require major surgery while others needed only a mild administration tonic?

Answer by Arithmetic

Basically the answer is one of arithmetic. In the 28 or more coal-producing states there were in operation in 1941 6,822 mines with a capacity of more than 1,000 tons a year. These mines were owned by some 5,000 companies. No coal company produces more than 3 percent of the total yearly output of bituminous coal. If all coal openings, including small truck mines and country banks, are considered, the number of owners jumps up to 13,000 to 15,000, the majority holding mines with capacities of less than 50 tons a day. In the words of one operator:



"Any guy with a bucketfull of slack is an operator."

The 28 or more coal-producing states embrace 92 different fields, the U. S. Coal Commission found. No field has a market to itself and in many cases a dozen or more regions compete in one market area. Thus there is competition not only between producing districts for the same market but between mines within the producing district itself.

No other basic industry in the United States faces a similar ownership situation. Two of the biggest buyers of bituminous coal, public utilities and railroads, are owned by a mere handful of operators compared to the coal industry, and their rates are set by government or State regulation. Yet the raw material they buy to manufacture the services they sell is purchased in a wide-open market in which hundreds and thousands of producers are competing.

In industries where the corporate units are large, difficulties with the price structure are reduced. This philosophy underlaid proposals for merging bituminous companies in the years prior to 1933. But, assuming that they could have avoided conflict with the Sherman Anti-Trust Act, they posed almost insurmountable difficulties in reaching agreements on merger terms. Cooperative marketing, about the only other voluntary solution, bumps up against the Sherman Act also, and even when permitted, as in the case of the district sales agency, is dependent for its effectiveness on the strength of the contracts between agencies and their producer members.

Capacity vs. Demand

The argument was heard frequently during the hearings on extending the Guffey Act that if the industry would reduce its overcapacity, its price structure would automatically be strengthened. While that probably is a perfectly valid axiom of economics, it fails to work out in an industry where the demand is anything but constant.

The curves of bituminous production and capacity, starting reasonably close together, gradually widened until in 1922, when the production was 422,000,000 tons, the difference was 410,000,000 tons. Since that time the difference has decreased. In 1942 estimated capacity was 690,000,000 tons while production was 580,000,000.

There were honest if not sound reasons for both conditions. Capacity and production necessarily increased during the First World War. But capacity, because anyone who had a pick and shovel could become a coal operator, quickly got out of hand, and when the war was over had far outstripped any anticipated demand. Two other factors combined to force down the production curve and accentuate the capacity differential: competition from other fuels and energies, including natural gas and oil, and increased efficiency in the use of coal.

The picture in World War II is radically different. Now it takes much more in materials and equipment to start a mine. Therefore, the government through WPB and other agencies has followed the policy of utilizing existing operations to the fullest extent, permitting new operations to open only to meet new demands in certain regions or to supply special-purpose fuels, such as metallurgical coal. Coal therefore will have little war-built capacity to liquidate when the present conflict is over.

Right here, incidentally, is a good place to point out that had it not been for the industry's overcapacity it would never have been able to meet the sudden and insistent demand for more production to fuel the war program. Industry, railroads, utilities, shipping, all trumpeting at once for more fuel, would have found themselves with empty bunkers and long faces, and the war effort would have suffered until the necessary coal-mining facilities could have been provided.

But, aside from these emergency demands, a substantial overcapacity is a peace-time necessity. The reason is as simple as the solution is difficult: people in normal times persist in buying coal in the winter despite the industry's missionary work. Coal must be geared to meet the seasonal peaks, and what a howl would be raised if it were not! So overcapacity is necessary to take care of normal requirements, although no one denies that excessive overcapacity complicates the problem of stabilization.

The chief evil of overcapacity is not in overcapacity itself but that it invites price cutting when the market is dull. And unrestricted price cutting leads to distress coal and dislocation of the industry's economy.

The combination of the three factors of dispersed ownership, overcapacity and seasonal buying exert a pressure on the price structure of coal which no other basic industry must withstand. When it becomes excessive, the result is one of two things: the price structure collapses, and along with it the industry, its capital investment and its employees; or prices must be artificially regulated by one means or another to withstand the pressure.

The consequences of collapse or near-collapse are enormous. The industry and the nation have had too many tastes of them not to know they are bitter. When the industry fails to make a reasonable profit on its capital investment or, at the worst, recapture its cost of production, labor is squeezed, owners and stockholders suffer and not even the consumer, buying for less, is benefited in the long run. No free economy can long remain unaffected by the impact of the wholesale distress of one of its most basic members.

The consequences of artificial regulation are, of course, what the arguments over the Guffey Act are all about. Regulation can come from within or without the industry. It can take the form of combinations and mergers, fair-practice codes, regulation of production, sales agencies, legislation or nationalization, to name some of the more prominent.

Why is it so necessary to be concerned with coal's future? To a coal man the answer is obvious. Coal is a natural resource, one of our most important, certainly our most abundant, and over its conservation and development everyone—not only those engaged in mining and selling—should feel a responsibility.

The Public's Stake

Coal mining is a "wasting" industry. Once a ton of coal is dug nothing can be done about replacing it. That ton of coal is gone forever. It won't grow again like Medusa's locks, and you can't glue it back into place in the mine. It is one more ton of a natural resource which has been dug out of the earth and there is no replanting that will bring it back.

It becomes a public responsibility, therefore, to see that no ton of coal mined is wasted. That means, in effect, that for each ton of coal produced the operator should receive a reasonable profit and the miner a reasonable income. Unless they do, the nation's economy is the loser.

If the mine operator is selling his coal at a loss in a highly competitive market, he can do two things: give up or cut his cost. One way of cutting cost is increasing efficiency through increased use of machinery. But machinery costs money and money can be derived only from the sale of coal. Therefore, a chance at a profit is a necessary prerequisite to mechaniza-

WHAT THEY SAY ABOUT THE COAL ACT

"Events of the last two years have proved conclusively that this country needs a solvent coal industry and the experience of almost 20 years prior to the operation of the Coal Act showed that the coal industry cannot be in a solvent condition in peacetime without government regulation."—*George W. Reed, vice president, Peabody Coal Co., Chicago.*

"While I am in no sense committed to the formula of the present act for an indefinite extension under normal times and conditions, I am certain that it is in the interests of the public as well as the industry that the act be extended for the duration of the war and for a reasonable fixed period beyond the war period to assure against disorder which will follow the termination of present control."—*Henry P. DeBardeleben, president, DeBardeleben Coal Corp., Birmingham, Ala.*

"In my opinion the Bituminous Coal Act should be continued as an example of good and proper stabilization of a naturally uncertain and chaotic industry. It has been a great stabilizer and in the days to come, after the war, will be more greatly needed than it has been in the past."—*R. M. Davis, Davis-Wilson Coal Co., Morgantown, W. Va.*

"Permitting the Bituminous Coal Act to terminate would at once give assurance to the coal industry in two important particulars with reference to postwar competition. First, it would eliminate the artificial, arbitrary and unsound competitive relations between the coals of different districts that the operations of the Bituminous Coal Act have already disclosed. Second, it would eliminate the setting of coal apart with artificial government controls that will destroy its opportunities to meet competitive forms of fuel and energy."—*H. R. Hawthorne, vice president, Pocahontas Fuel Co., New York.*

"We want the coal industry to be prosperous. We want the coal industry to employ the largest number of men at fair and reasonable wages. But the only way by which the coal industry can do this is to be allowed again to become a free industry—to be allowed to sell its product for its value to the consumer. Since it is a competitive industry, it must be allowed to compete in the only form of competition which counts—that is, in price."—*Rolla D. Campbell, Island Creek Coal Co., Huntington, W. Va.*

tion and higher efficiency. Coal mining has not been loath to spend millions for this purpose in the last 25 years, and these expenditures, particularly in the last ten years, have undoubtedly prevented even higher prices as a result of wage increases.

But there is a limit, of course, to cost cutting through efficiency improvements, and in a highly competitive market, in the absence of other controls, the wage structure tends to become the avenue of attack. And since lower wages grow out of lower prices, the miner's income tends to suffer with the operator's profit, with consequent disruption of the industry, employee discontent and adverse repercussions on society in general.

In the period just before NRA, for instance, when the industry was losing anywhere from $44,000,000 to $51,000,000 a year, wage scales in many fields had touched the 1916 level of $2.98 and had fallen, in some places, to as low as $1 a day.

In great measure that unhealthy and distressing situation grew out of lack of any sort of regulation over the breathless, panicky pursuit of what coal market existed. Its effects in lower prices delighted some consumers, but brought untold distress to miners and owners. Since labor costs then comprised upward of 70 percent of the producer's expense, they almost inevitably became the chief resort of operators hard pressed by price cutting.

Coal's Own Plan

The industry's pains, accentuated by the depression of the early 30's, brought out, as stated, a variety of stabilization proposals. Out of them came coal's own plan—the sales agency—a combination of producers grouped more or less loosely together to stabilize the market for a specific producing area. But the sales agency ran afoul of the Sherman Act almost at once, although it eventually weathered the storm. Early in 1933, the Supreme Court held that Appalachian Coals, Inc., the first sales agency and the model for others later, was outside the scope of the anti-trust act and in the public interest. The cautious court none the less kept a string attached to its decision, empowering the lower court to retain jurisdiction with the right to "set aside the decree and take further proceedings if future developments justify that course in the appropriate enforcement of the anti-trust act."

The decision gave heart to other proposed sales agencies and a little covey of them was formed. Before they had a real chance to function, however, the Blue Eagle of NRA made its appearance. But once more the Supreme Court took a hand, this time in a different mood. The Nine Old Men shot the eagle like a sitting bird in May, 1934, only eight months after the coal code was signed.

But all this had had its effect. The coal industry, either through absorption or a discernment of things to come, had in some measure stabilized prices, and, though it continued to lose money, things were looking up. A legislative flurry sprang up in both houses, and the two coal acts followed.

The average value of bituminous coal and lignite rose from its 27-year low of $1.31 in 1932 (1916 was $1.32) to $2.19 in 1941 and $2.35 in 1942, with some recessions, such as in 1938, when the first price schedule was abandoned. Reflecting the increased realization, the industry's financial picture, as shown by income-tax returns, showed a reversal from a loss of $52,000,000 in 1932 to a profit of $4,000,000 in 1940, the last year for which figures are available. This turnabout was made on a relatively small per-ton profit, according to Bituminous Coal Division figures. The loss per ton (representing the difference between weighted average cost and average bituminous realization) was 4c. in 1936, 9c. in 1937, 11c. in 1938, and 5c. in 1939. In 1940, bituminous coal showed a gain of 1c. per ton, 7c. per ton in 1941, and 8c. in 1942.

The results in the last three years, of course, cannot all be credited to the Guffey Act since the industry has benefited from war production. But certainly, before the defense program was launched, the presence, real or implied, of an enforceable minimum price schedule had much to do with the industry's recovery.

The Guffey Acts were by no means perfect. In fact, the Supreme Court found the first one so little to its liking that it tossed it out. But they did place a floor under coal prices and did have sufficient teeth so that the industry at least "had its pandemonium regulated."

Dan H. Wheeler, director of the Bituminous Coal Division, explained the act's functions in this fashion to the Ways and Means Committee:

"The division is directed by the act to establish and maintain minimum prices for bituminous coal which will enable minimum price areas, enumerated in the act and located in the mining fields, to recover the weighted average of certain of their costs of production. The division is empowered to collect and edit costs and distribution data so that it may be ascertained what minimum prices must be initially established and what revisions in minimum prices must be made to maintain, upon as current a basis as possible, an equivalence between costs of operation and 'minimum price realization . . .' The division is empowered to enforce compliance with minimum prices and with the statuatory proscription against certain unfair methods of competition which are set forth in the statute."

The new bills, in addition to provisions for court reviews and certain other charges, eliminate the 1c. tax by which the industry financed the act and permit temporary adjustments in minimum prices pending a full-dress hearing on revision.

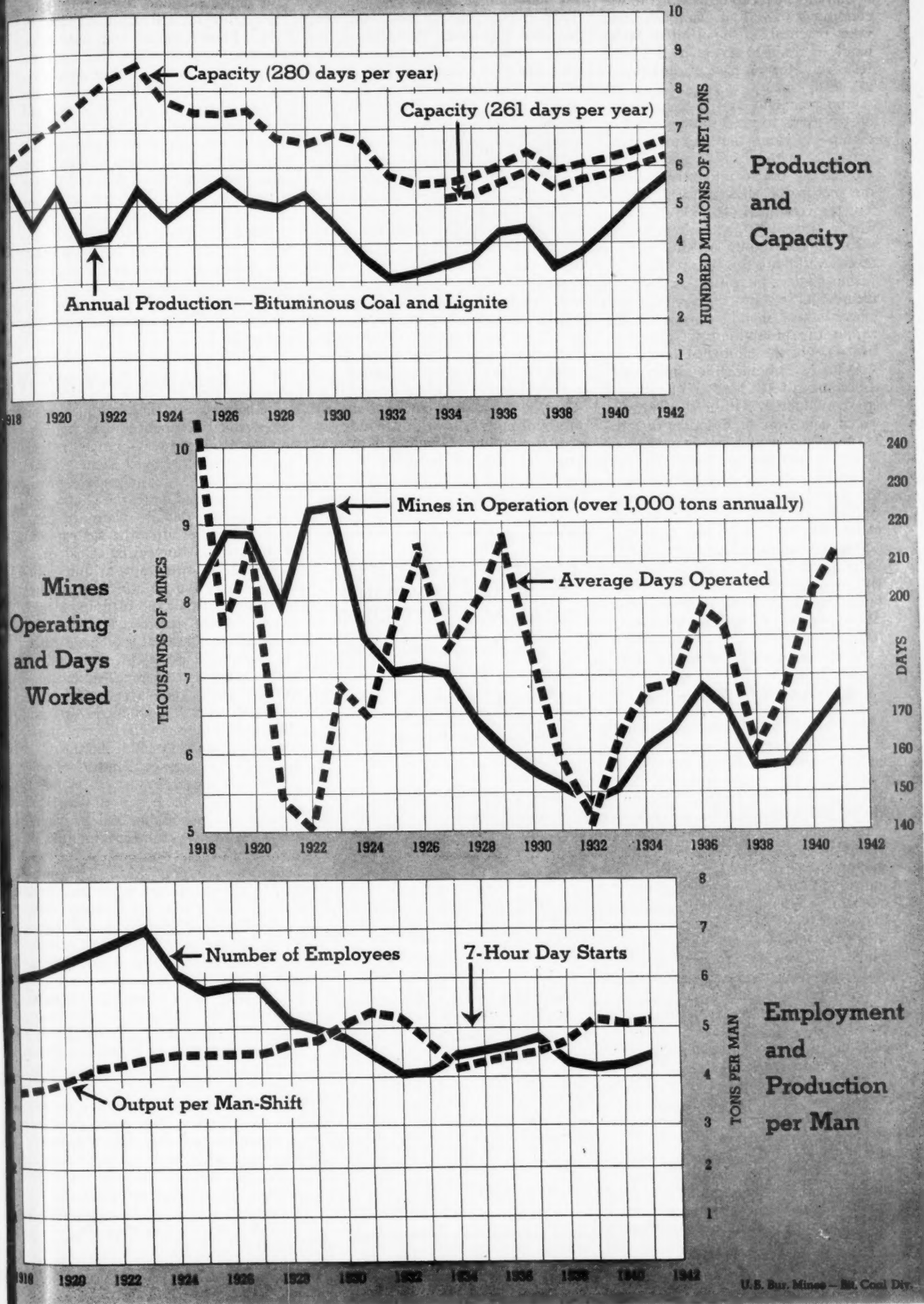
Did the Act Work?

Whether the act accomplished all it set out to do was thrashed out before the Ways and Means Committee. Wheeler, the Department of the Interior, and most of the operators seemed to think it did. Some operators, and some members of Congress, believe it unnecessary, even against the public interest. But let it be said that there was more of politics than policy when the extender was bottled in the Ways and Means Committee last June by a two-vote margin. Some members of the committee were pouting under a White House tongue lashing over legislation and took delight in thumbing their noses at the administration. Other members, and most of the House, for that matter, were in a hurry to get home for some summer fence mending.

The Guffey Act is far from the only means by which an endeavor can be made to stabilize the coal industry on a profitable basis. Because the act will soon expire it might be pertinent to examine these alternatives.

The most drastic is complete nationalization of the industry, the background for which was sharply etched by Deputy Federal Coal Mines Administrator Carl E. Newton in his address before the American Mining Congress at Cincinnati. Books can and have been written about nationalization, but the practical question is: "Will it work." Perhaps experience in Great Britain, the only one of the democracies to have anything approaching complete nationalization of coal, might serve as an indicator. Great Britain has taken over ownership of the coal within its borders and as a war-time measure has assumed practically complete control over all phases of mining. What have been the results? Briefly, they can be measured by complaints over loss of efficiency, reduced tonnage and lack of interest among employees,

BITUMINOUS COAL AND LIGNITE SINCE 1918


Capacity (280 days per year)
Capacity (261 days per year)
Annual Production—Bituminous Coal and Lignite
HUNDRED MILLIONS OF NET TONS
Production and Capacity
Mines in Operation (over 1,000 tons annually)
Average Days Operated
THOUSANDS OF MINES
DAYS
Mines Operating and Days Worked
Number of Employees
7-Hour Day Starts
Output per Man-Shift
TONS PER MAN
Employment and Production per Man
1918 1920 1922 1924 1926 1928 1930 1932 1934 1936 1938 1940 1942

U.S. Bur. Mines—Bit. Coal Div.

not all of which can be ascribed to war conditions. Even if nationalization were practicable, the United States hardly is ready to accept it. But both Ickes and Newton have warned that it is a lively threat.

Fundamentally, what the coal industry seems to need most is relief or exemption from the Sherman Anti-Trust Act, with adequate safeguards to protect the public interest. This was the goal in the sales-agency plan, and it is the very heart of the Guffey Act, which says: "No action complying with the provisions of this section taken while this act is in effect, or within 60 days thereafter, by any code member or by any district board or officer thereof, shall be construed to be within the prohibitions of the anti-trust laws of the United States."

With expiration of the Guffey Act, it becomes a moot legal point whether any combination within the industry which endeavors to fix prices directly or indirectly would be construed as being in restraint of trade. In this regard, it must be remembered that the Supreme Court which approved Appalachian Coals was of a considerably different social and economic persuasion from the Supreme Court of today. And there is a decided difference of legal opinion on whether the purifying atmosphere of the Guffey Act would prevail once its protection had been withdrawn, the Appalachian Coals decision notwithstanding.

Outlook for Agencies

In the light of those opinions, what is to become of the regional sales agencies which functioned before and under the act? At the moment, they are the only visible means of exerting any degree of control over prices, and if they should be adjudged in violation of the law, even the partial relief which they might offer would be denied the industry. Combinations or sales agencies which endeavor to control marketing conditions were the havens to which the industry first turned and to which it is likely to turn again. But to make efficacious use of those methods of circumscribing ruinous price-cutting, clear exemption from the Sherman Act is needed, and no encouragement on that score has come from any official source.

The industry had tried on some occasions to institute its own fair-practice codes, but found them an unsatisfactory method of regulation, largely because they lacked authority. Fair-practice codes based on State laws, suggested when the industry was in the depth of its depression, unquestionably would become involved with the question of interstate commerce. They might possibly be a solution, provided they could be enforced, for those companies whose mines, shipping lines and markets are located within one State. But it is doubtful if they would prove of much help to the interstate producer.

The quota system has helped the anthracite industry and also has escaped scrutiny by the Supreme Court —at least so far. Whether it would work for bituminous coal is another matter. Anthracite is located exclusively in eastern Pennsylvania, and, being in one area, regulation of production is a matter of comparative ease. But could it operate effectively, and legally, in an industry which produces in 28 or more states? Once more, exemption from or liberalization of the anti-trust laws becomes essential before such a cure could be undertaken.

But be the remedy constitutional or not; be it pure or hybrid; the industry faces the option of finding it or running the risk of reverting to the chaotic days of the 20's and early 30's. For no matter what else may be vague and debatable, one thing is certain: the Guffey Act will expire at midnight Aug. 23 and from then on, until some concrete step is taken, the industry will be without any kind of regulation except that which it imposes on itself.

The blow, of course, will not fall at once—perhaps not this year or even next—for the war market will support coal, and the government will demand more and more production, but nevertheless thoughtful operators are concerned, and their concern has not been lessened by reports at the end of July that the price of coal in some areas had fallen as much as 75c. There appeared little doubt that the prospect of having the price floor suddenly yanked out from under the industry was to blame.

Planning Lags

Perhaps because the consequences of unrestrained competition are not imminent, the industry generally had made few plans to meet them. Of the fourteen marketing agencies provisionally approved under the Guffey Act only one has definite plans for continued activities after the act expires. A telegraphic survey by *Coal Age* found one or two ready to quit with expiration of the act and most of the remainder only in the planning stage. R. E. Howe, executive director of Appalachian Coals, Inc., stated that "all activities are pointed toward a better and more economical utilization of solid fuel." The agency now has contracts with 50 producers to sell their entire output. These companies operate in four states and ship into 28. In 1942, the agency handled about 35,000,000 tons.

But perhaps more cogent than the present bull market in coal in deterring sales agencies from making future plans were these words of Wheeler's before the Ways and Means Committee: "I have been further advised that if the Coal Act is not renewed the exemption from the Sherman Anti-Trust law provided by Sec. 12 of the act would cease to have any effect whatsoever."

Operators who remember the lean days after the last war are seriously concerned about what will happen if the Guffey Act is not extended. But, so far at least, they have made few definite plans to meet the situation. There are numerous ones they could try. The Guffey Act probably left much undone and unquestionably mistakes were made in its administration.

But the act had at least two advantages over any other stabilization process yet suggested. It was handy, and it was legal.

PERCENT COMMERCIAL TONNAGE FAVORING COAL ACT EXTENSION

(Coal Producers' Committee)

1. Eastern Pennsylvania	85
2. Western Pennsylvania	89
3. Northern West Virginia	95
4. Ohio	65
5. Michigan	55
6. West Virginia Panhandle	100
7. Southern No. 1	63
8. Southern No. 2	90
9. Western Kentucky	78
10. Illinois	64
11. Indiana	9
12. Iowa	61
13. Alabama	99
14. Arkansas and Eastern Oklahoma	53
15. Southhwestern	23
16. Northern Colorado	100
17. Southern Colorado	49
18. New Mexico	31
19. Wyoming	66
20. Utah	46
22. Montana	100
23. Washington	32
United States average	74
Total tonnage represented,	339,000,000

Fig. 1—Gathering head disk with holes drilled and tapped and a longer nut applied.

LOADER IMPROVEMENTS

Meet Local Conditions and Raise Output

Recurring Troubles Are the Signals for Intensive Search for the Cause and Remedy at Federal No. 1—Redesigning Weak Links Often Shows Up Next Weaker but Perseverance Results in Real Progress

PREVENTIVE maintenance possibly is a misnomer but it expresses the great importance of the machine improvement work usually handled by the maintenance department of a mine and which, effectually accomplished, earns compound interest at a high rate. In Federal No. 1 mine, Koppers Coal Division, Grant Town, W. Va., machines load all the better-than 2,000,000 tons produced annually. Therefore, they have been the target of intensive work to adapt them to the high tonnage loading they are called on to get out. Most of them are served by rubber-tired shuttle cars and the delays are small. These loading machines must hit the ball—they get little coddling or rest.

To cite some of the outstanding changes, beginning at the front end of the loader, the gathering head disk (Fig. 1) was drilled and tapped at two points to accommodate 2-in. pipe plugs. These give socket-wrench access to the nuts on the six bolts holding the pot, or gathering arm and front conveyor gear case, to the frame. Before, the lisk had to be removed to tighten these nuts.

An extra long nut on the end of the disk shaft also is shown in Fig. 1. The original nut often stripped its thread. With the original ball bearing there was no extra space for a thicker nut with more thread. So another size bearing with a larger bore but the same outside diameter was substituted. The smaller part of the new long-thread nut forms a collar between the shaft and inner race of the bearing. Clarence Ruckman suggested this change, which eliminated stripping of threads.

Another revision was aimed at preventing pot bolts from working loose and throwing the foot shaft out of line, causing breakage of one chain of the front conveyor. Figs. 2, 3 and 4 show the new arrangement, which reduces shearing strain on the bolts and provides a stronger anchorage without additional bolts at the front.

At the rear end of the gathering head space for the pot, a filler plate 1 in. thick and two gusset stays are welded in. The edge of this plate butts tightly against the pot flange. At the front end, a ½x½-in. square piece is welded to the frame and a keeper bar ¾ in. thick is used on top of the pot flange, extending under the ½x½-in.

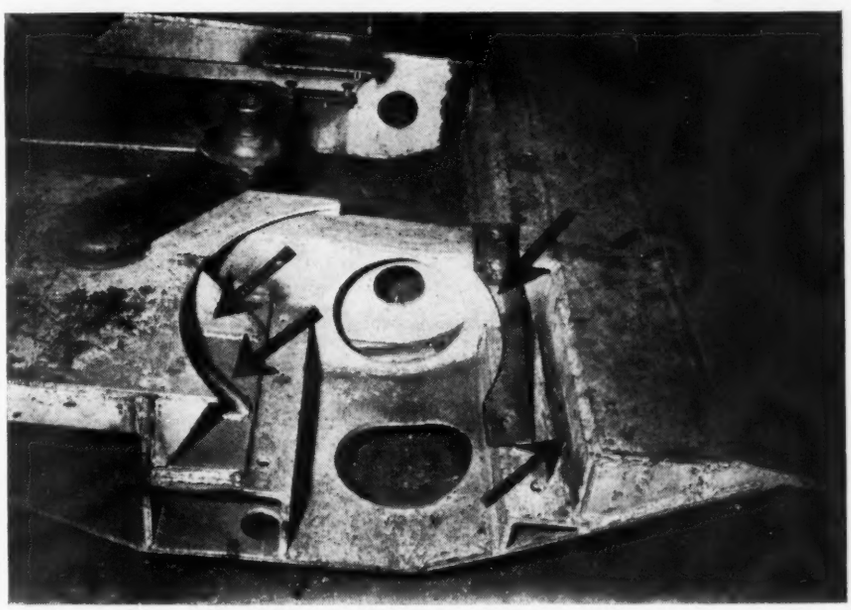


Fig. 2—Arrows indicate added gusset, filler plate, keeper bar and ½x½-in. welded strip.

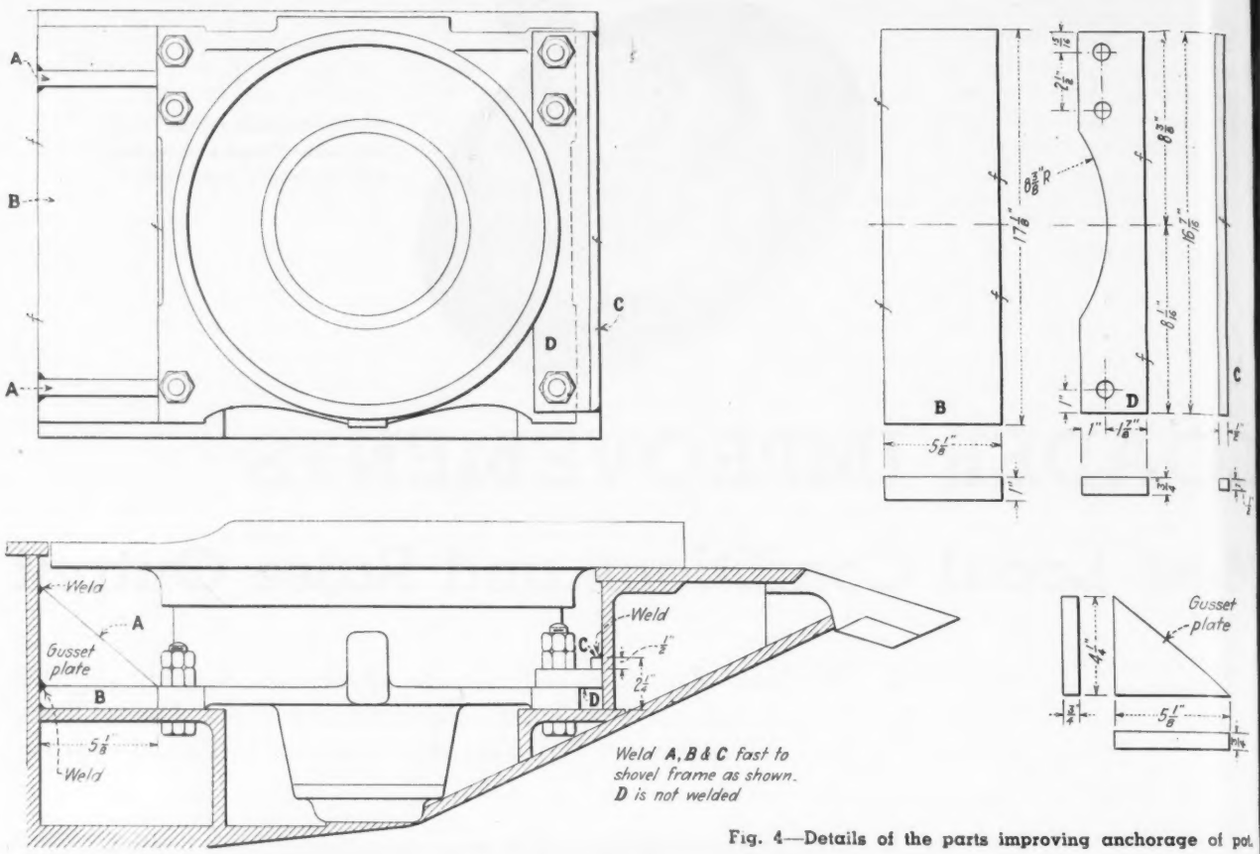


Fig. 4—Details of the parts improving anchorage of pot.

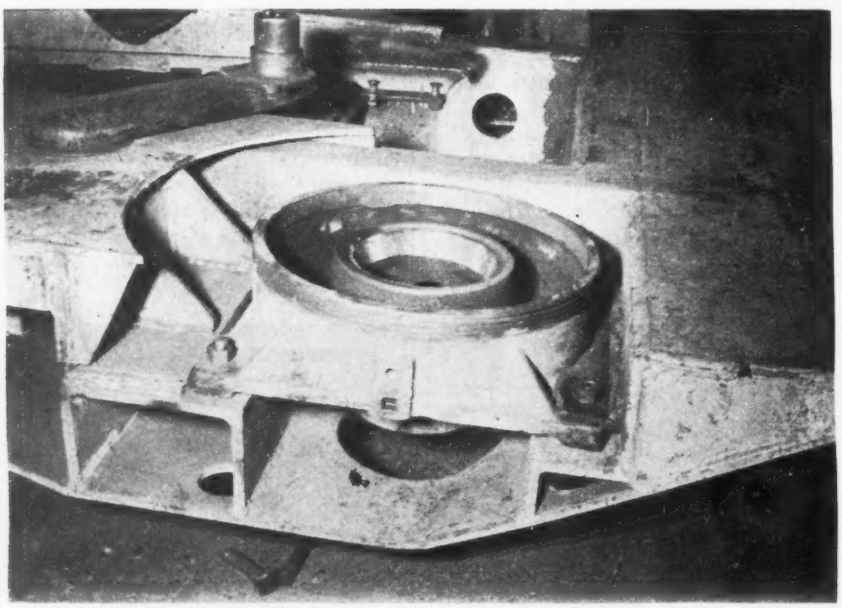


Fig. 3—Pot temporarily in place to indicate how keeper bar is used.

square anchorage. The latter is attached to the frame 3/32 in. low so that when the bolts are tightened a leverage is exerted and the keeper bar must spring slightly. All pots are altered to a standard outside flange dimension to make them fit snugly against the added backstop. This and other changes in the front head are the work of Harry Connors.

The method of adding a sprinkling connection with a protected nozzle is shown in Fig. 5. Connections are ¾-in. pipe and the nozzle protecting hood is a piece of 3-in. pipe cut on a bevel and welded to the frame. Extra strength is secured by a gusset welded between the pipe and frame.

Another difficulty was breakage of the capscrews holding the motor to the front transmission case. To provide eight fastenings (four bolts and four capscrews instead of just the four capscrews, the parts shown in Fig. 6 were made and welded to the tops of the transmission case and motor housing. The part for the motor consists of a 3x3x½-in. angle iron 15⅞ in. long. The other is made from a piece of ¾x3-in. bar 27¾ in. long. Its fastening is strengthened at the center by a gusset to the digging head housing.

Bolts holding front jack guides in place bent when subjected to severe strain and allowed the brass guide to spread, in turn causing rapid destruction of the plunger packing and allowing oil leakage. Figs. 7 and 8 show a guide damaged by spreading. The straightedge placed on top of the one in Fig. 7 indicates how much the fitting surfaces of the flanges have been forced out of line. The spread condition also is shown by the loose fit of the guide on the plunger in Fig. 8.

That difficulty was remedied by machining the outside edges of the guide flanges to a standard over-all width and then welding filler blocks to the motor case and front transmission to act as backstops for the guide—that is, keep it from spreading. The change practically eliminates bending and shearing strain on the bolts and relieves the bolt holes in the guides from distortion and wear. This method, worked out by Bill Wilson, has proved effective in halting destruction of guides

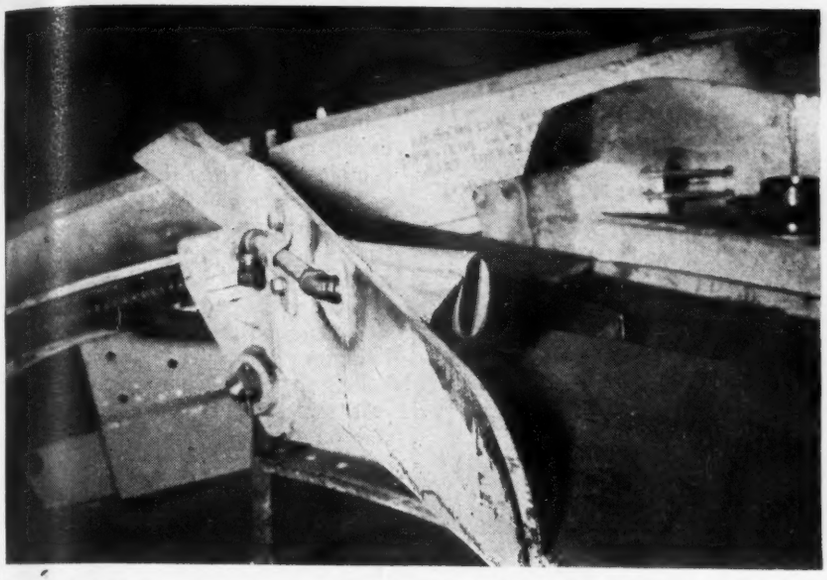


Fig. 5—Sprinkler connection and nozzle protecting hood. On the other side is one of the same design.

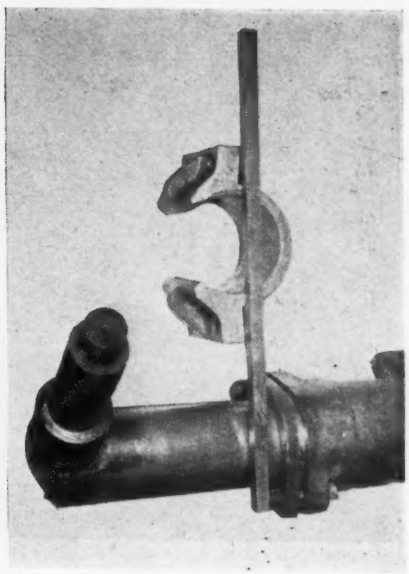


Fig. 7—Straightedge indicates that the fitting surfaces of the guide flanges are out of line due to spreading.

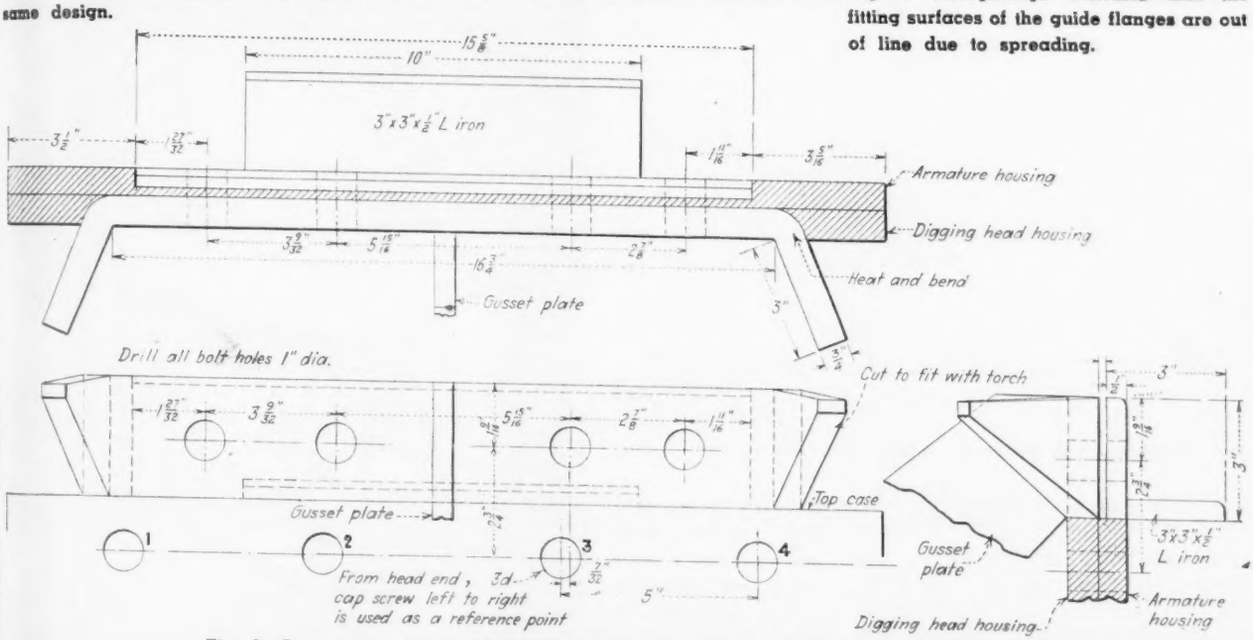


Fig. 6—Parts for applying additional bolts between motor and front transmission case.

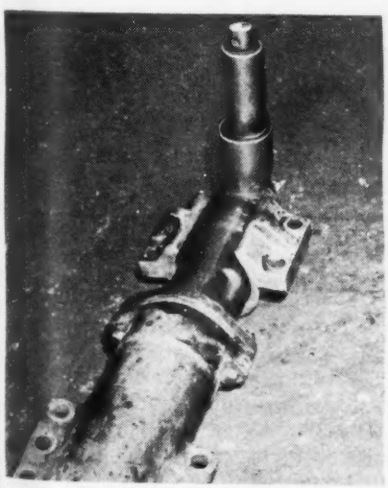


Fig. 8—Guide placed on plunger to show that it fits too loosely to protect packing.

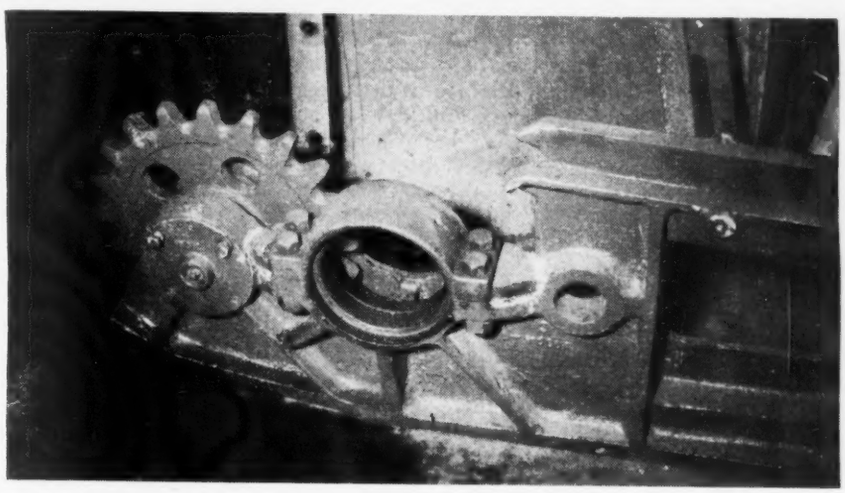


Fig. 9—Blocks welded in butting against ends of bearing cap. Also the bolt heads are drilled and projections added below to keep the nuts from turning.

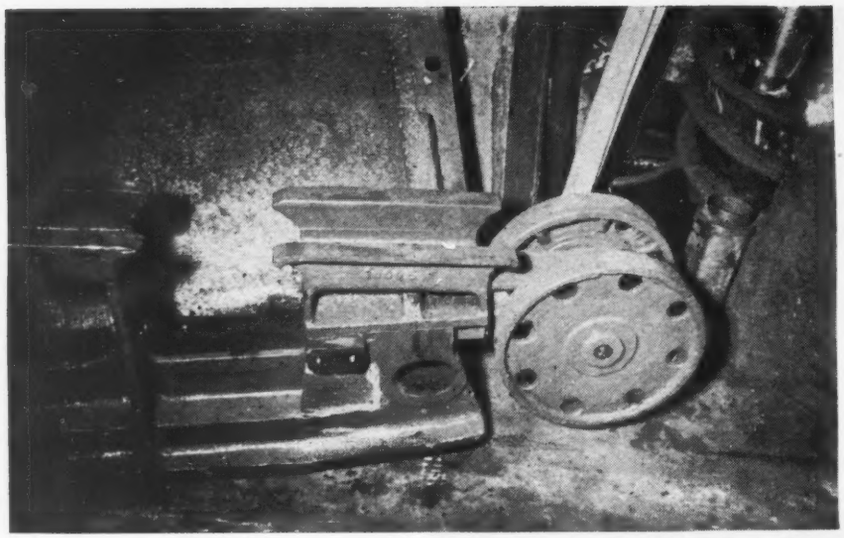


Fig. 10—Chalk marks forming a right angle just below the two small holes indicate welds of the filler plate that eliminated overhang.

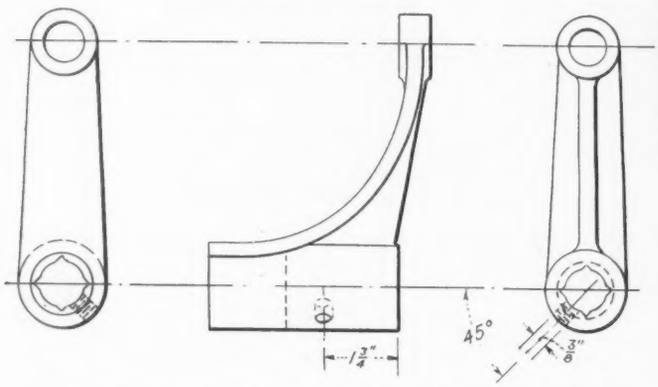


Fig. 11—Holes and setscrews added to loading clutch collar.

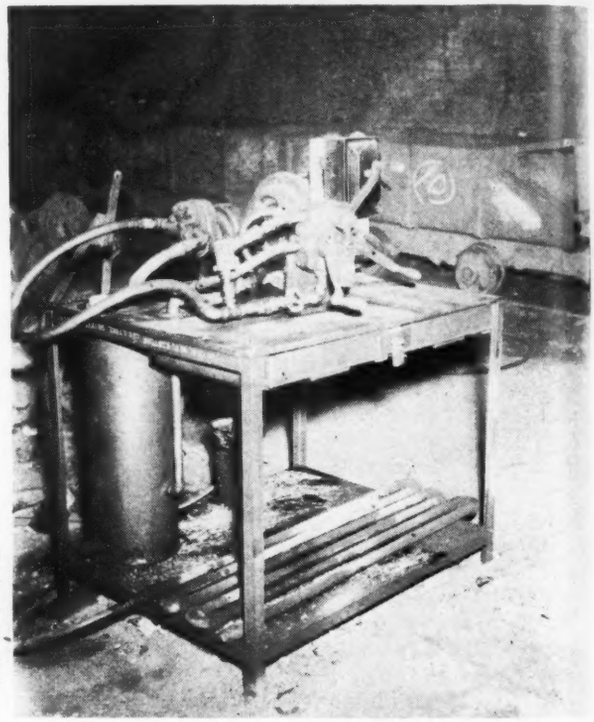


Fig. 12—Testing table with repaired pump and valve left in place, either one ready for testing the next unit that comes in for check or repair.

valve testing table and outfit shown in Fig. 12. It is self-contained, with 5-hp. motor and starting switch, and is semi-portable. A control valve and a pump, both "repaired, tested and O.K.," are always left connected when completed. When the next doubtful or bad unit comes in, assuming it is a pump, the repaired unit is removed for stock and the questionable one connected in its place. Then the latter is tested with the valve which is known to be in good condition.

Pump and valve frames are left bolted in place when the repairs or part replacements are made. Valves stay on the table and are exchanged for the bad-order ones in the same routine as the pumps. Thus, there is always a good pump to test a doubtful valve. The oil reservoir and a coil of pipe simulating actual conditions on the loading machine are mounted lower down in elevation than the pump and valve. This eliminates the danger of large air pockets forming that might be disastrous in case of a failure at the high pressure.

Having the testing equipment on its own table (top dimesions, 36x45 in.) has the advantage that a man can work freely any place around it. A feature of the mounting is a cone guard with surrounding annular flange to catch and drain oil that might leak through faulty pump packing. Before this was added it happened several times that a defective pump squirted oil "all over the place."

and packing and preventing oil leaks.

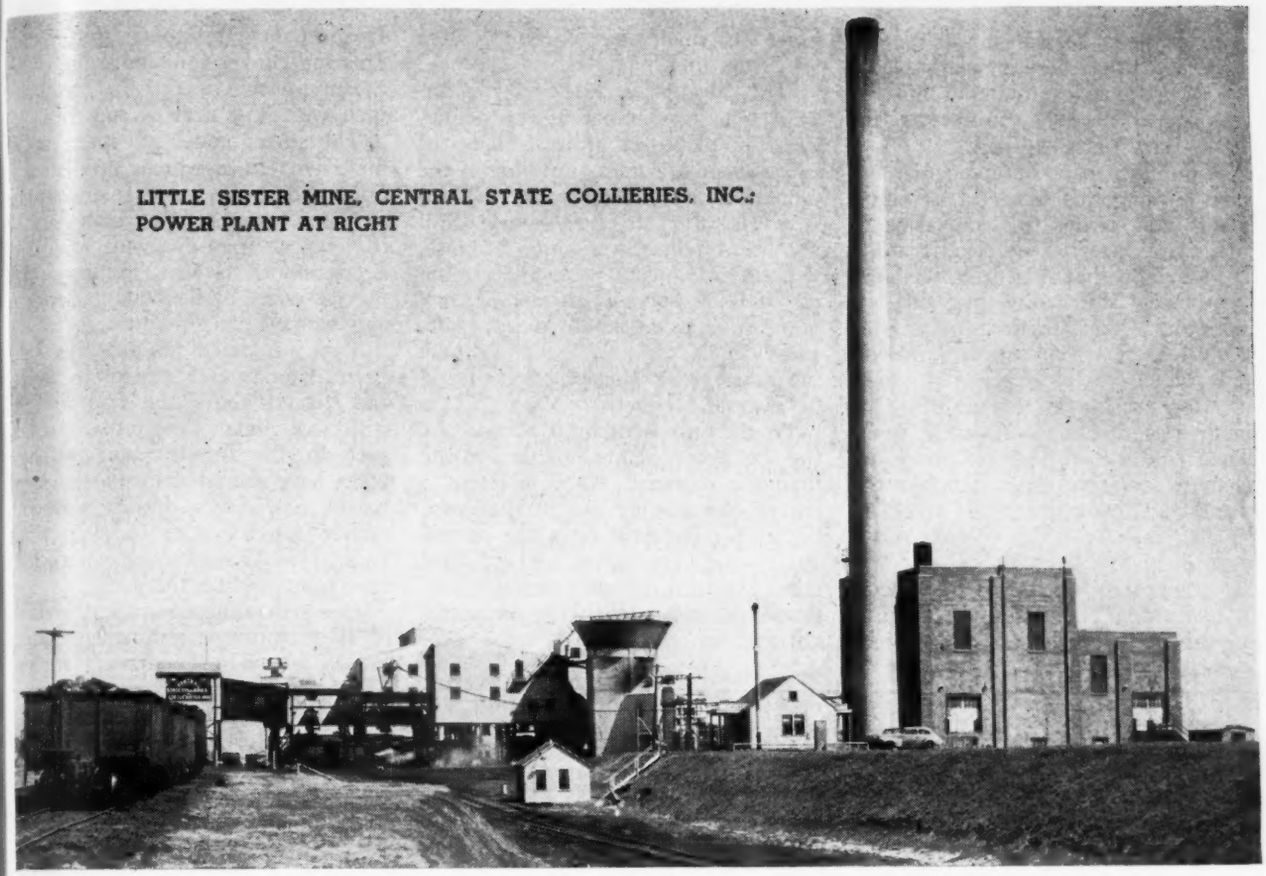
Another change, consisting of stops to relieve bolts of side strain, was made on the crawler frame. The front axle caps have been altered to a standard outside dimension and the stop blocks welded to the frame, as indicated by the chalked welds near the large bolt heads in Fig. 9. Another improvement was drilling the bolt heads for wire locking and welding fillers or projections to the frame to prevent the nuts from turning.

Breaking of the guide ways serving the take-up was another difficulty on the crawler. The effect of tipping started breaks at the point of overhang. As indicated by the chalked weld bead in Fig. 10, fillers or gussets were added to eliminate the overhang. Harry Connors is the daddy of these crawler improvements.

W. T. Dalton, maintenance superintendent, suggested a gear-shift lever change greatly reducing damage to teeth on the low gears. Originally, the weight of the lever itself tended to shift the transmission out of low gear, which is used the most. He added a tension coil spring 12 in. long between an anchor pin set in a hole drilled in the shaft and a lug welded to the frame. This tends to hold the lever in low. It does, however, tend to pull it out of high, but that gear (high) is used only for tramming and does not give trouble.

At times, the shaft of the loading clutch would slip endwise. That was cured by adding $\frac{3}{8}$-in. setscrews as shown in Fig. 11. The holes for these screws are set at a 45-deg. angle with the diagonals of the square holes and are positioned so that the screws can be tightened through the existing inspection holes.

Ted Fortney built the pump and



LITTLE SISTER MINE, CENTRAL STATE COLLIERIES, INC.: POWER PLANT AT RIGHT

POWER SALVAGED

By Properly Using Otherwise Waste Coal

Large Heat Values Contained in Slurry and Dust — Proper Processing and Special Firing Equipment Permit Salvage—How It Is Done in One Utility and Three Mine Power Plants in the Middle West

By ***FRED W. RICHART***
Assistant Editor, Coal Age

RAISING COAL'S efficiency in use and making it more desirable to the consumer has been the goal of widespread modernization of coal preparation plants and improvements of processes in recent years. Consumers have benefited and coal has been placed in a better position to compete with oil, natural gas and water power as a result of these improvements, which represent, in numerous cases, heavy outlays of money.

The goal of preparation is freeing coal of objectionable features, such as dust and impurities, and raising its burning efficiency to the highest possible value. Methods of reaching this objective include:

1. Removal of very fine float dust.
2. Elimination of ash and sulphur by washing or dry cleaning.
3. Application of a dustproofing material to keep the coal dustless until it is used.

The first and second operations naturally result in a byproduct which may be either a pure waste material or one with good fuel value, especially if further processed and burned in the right equipment. Fine coal, such as dust and slurry, falls in the latter class, with some mines as exceptions. Dedusting, for example, makes a product varying in size from $\frac{1}{8}$x0 in. down to minus 48 mesh in certain preparation set-ups. Much of it is 10 mesh or smaller. Its removal improves the quality of the coal, but if it must be wasted it represents a loss in heat value.

When this loss was small, the cost of equipment to recover and process the fines hardly was justified at many operations, especially those producing steam and domestic coal. As modern preparation methods have spread (with more crushing as one additional process) and as more coal is produced with equipment and methods increas-

ing the percentage of fines, the loss of fine coal has risen, in many places, to such tonnages that the industry has felt it necessary to recover the heat values contained in it.

A number of coal companies are now burning this fine coal in power plants and saving the equivalent in marketable sizes. One electric utility is located so that it gets its fuel supply of raw slurry directly from coal washeries. Use of this coal poses some problems, of which the most important, perhaps, is processing it to make it most suitable for boiler use. This is a vital first step in many cases. Then furnace equipment must be changed at some expense unless the plant was designed for such fuel, although such costs are in part offset by the expense that otherwise would be incurred in disposing of the fines at the mine. The technique of burning this fine coal also must be learned, since its small size introduces new problems in firing.

The advantages, however, are several. One is elimination of the disposal problem—or at least that part involved in the fines. Another is the reduction in production cost. A third is conservation of fuel values. Still another, offering even more promise, is demonstrating to potential consumers that the fines, when properly prepared and fired, can be burned efficiently and economically, thus building a market for what otherwise would be a waste product.

Proof of the pudding is afforded by the four power plants described in the following material. They represent a fair cross-section of one of the possibilities for fine coal from the central states—and elsewhere. They, and other plants in the same region, prove that fine coal is a reliable and economical fuel for power.

Antioch Power Co., Linton, Ind.

Operation of the Antioch plant, like others using the same type of fuel, demonstrates that fines can be used efficiently and economically if some of the things that make them a waste product are first removed. Improvement in the quality of the slurry used, through simple and relatively inexpensive cleaning facilities, now permits carrying the load on two boilers that originally could not be carried on three without the aid of considerable washed screenings.

The Antioch Power Co. is a local electric utility serving a number of coal mines in an active producing area and some of the municipalities in the same region. The steam-generating equipment consists of three 500-hp. Stirling boilers, fitted with Coxe chain-grate stokers, forced-draft fans and clinker chill above the grates. Steam pressure is 180 lb. per square inch with 150 deg. of superheat.

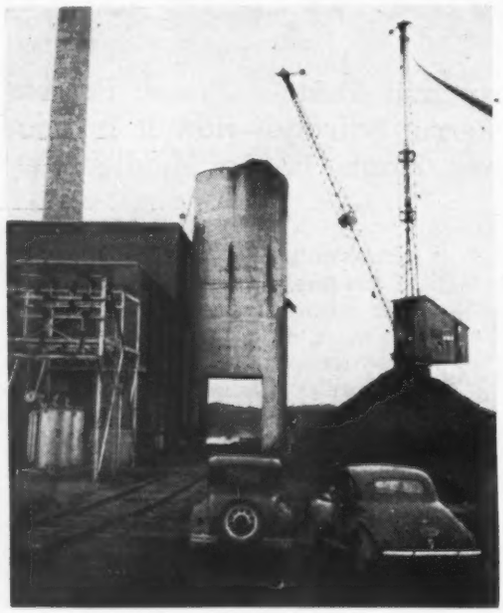
The stoker grates are made up of finger-type links which have straight sides and a 10 percent straight-line air space between. The grates are 17 ft. long, 9 ft. 4 in. wide and have a continuous forward motion which may be varied by the cone pulley drive and variable-speed motors.

Two 3-in. water tubes in the boiler circuit parallel each side of the grates and extend above the fuel level to chill the clinker and prevent adherence to the furnace lining. These tubes have special steel plates welded to the fire side to provide a smooth surface for the fuel to slide along (Fig. 1). The plates have a clean appearance in the furnace.

The generating equipment consists of three turbo-generators aggregating 10,200 kw. The condensers are surface type. Circulating water is sprayed in a small pond for cooling. This kind of cooling is quite general for small power plants, but there must be sufficient spray capacity to offset summer weather conditions.

The fuel is recovered from the waste slurry of two coal washeries nearby serving the New Hope and the Friar Tuck mines. The solids in this slurry consist of all the minus 1-mm. material from washery cones, which is washery waste. Slurry is first pumped, then carried by open flume to the power plant, where it is processed to remove excess clay and then washed.

Originally, it was attempted to burn this slurry by merely dewatering it. It then averaged 20 percent surface moisture, 25 percent ash and 25 percent sink at a specific gravity of 1.42.



Antioch power plant, stock pile and storage silo.

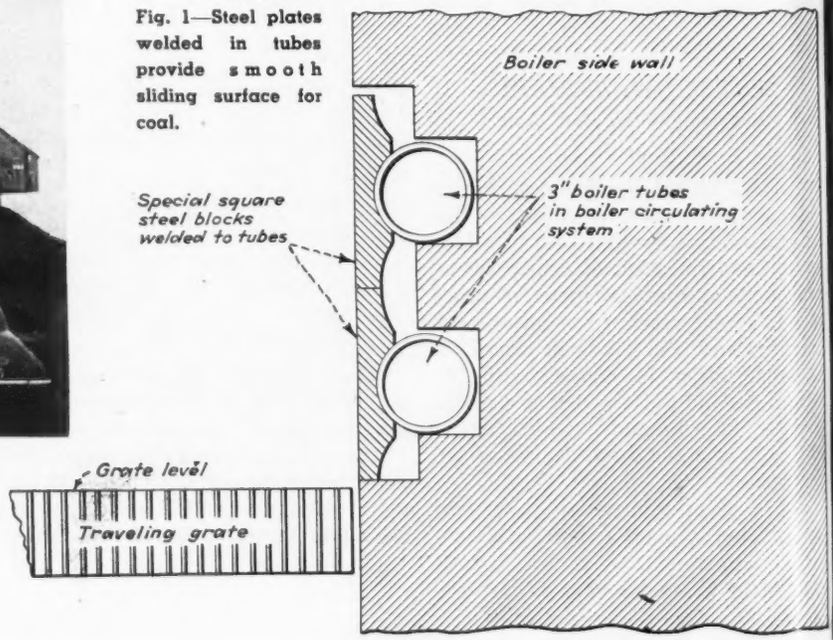

Boiler side wall
Special square steel blocks welded to tubes
3" boiler tubes in boiler circulating system
Grate level
Traveling grate

Fig. 1—Steel plates welded in tubes provide smooth sliding surface for coal.

About 20 percent of the solids held in original suspension in the water was finely divided clay.

The slurry was first treated by pumping it into bins and letting the water drain off. This permitted the clay to stratify. Without fuel value it caused dead spots on the grates when fed into the furnace. Screenings were added to carry the load.

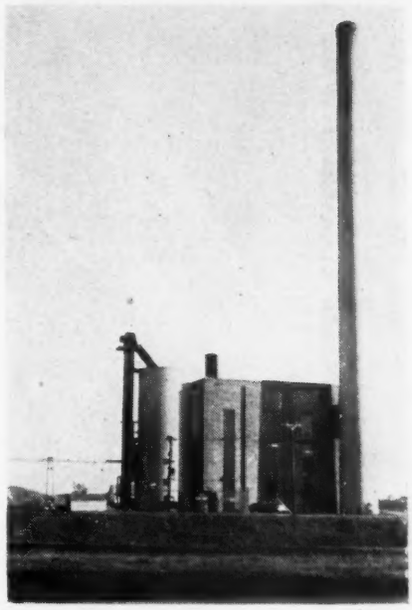
A 10-ft. stretch of ½-mm. wedge-wire screen set in the bottom of the flume carrying the slurry removed some of the clay and some of the sand and sulphur that dragged along the bottom. This eased the summer firing conditions, but with the arrival of fall and heavier loads it was evident more had to be done.

Following investigations and tests, two 7½x16-ft. Deister Plat-O coal-washing tables were installed. Each has a nominal capacity of 15 tons per hour. These tables remove slightly less than 50 percent of the sink from the coal put over them. The remaining clay is all washed out. The product normally delivered carries about 12½ percent of ash, but that may be varied from 9 to 15 percent, depending on the urgency for coal in the power plant.

The present arrangement for handling this coal, from raw slurry to stokers, is: the slurry, containing about 20 percent solids, flows in an open flume to the washing plant, passing over two sections of 21x60-in. wedge-wire screen having ½-mm. openings. Half the water and 30 percent of the solids are thus removed to the waste. The residue flows on into the settling tank.

Excess water from the settling tank is removed by two skimmer weirs and flows into the waste. The solids are removed from the settling tank by a 5x35-ft. drag conveyor, operating on an incline, and are delivered to the feed chutes above the washing tables, still containing 30 percent moisture. Fresh water is added, refuse going to waste and clean coal into bins.

A clamshell crane lifts the clean coal from the bins and piles it on the ground to drain. After draining, the same crane lifts it into the storage silo. From the storage silo, coal flows into a lorry, is weighed and transferred to the stoker hoppers.



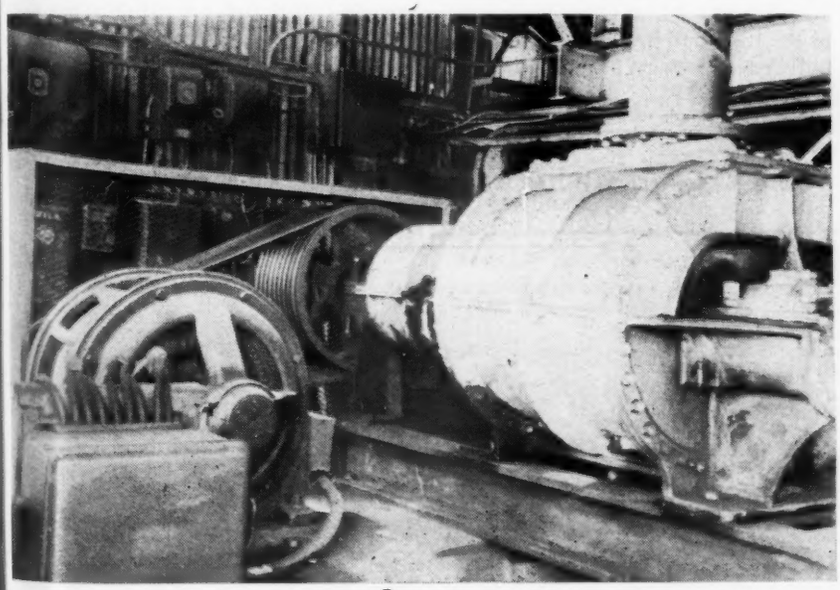
Central State Collieries, Inc., power plant, elevator, storage silo and smokeless stack.

Central State Collieries, Ind.

This operation produces its own power for the Little Sister strip mine, Canton, Ill., and for a 750-mile REA system having 1,500 customers.

Plant operation, as at Antioch, represents an evolution from raw slurry, which proved unsatisfactory, to a fuel rendered suitable and efficient by further preparation. One boiler now carries the load that two formerly had difficulty in handling.

In this power plant, the steam-making equipment is somewhat similar to that at Antioch. The generating machinery consists of one 750-kw. and one 2000-kw. turbo-generators operating on 150 lb. steam pressure, no superheat. Surface condensers provide vacuum and a spray pond cools the circulating water.



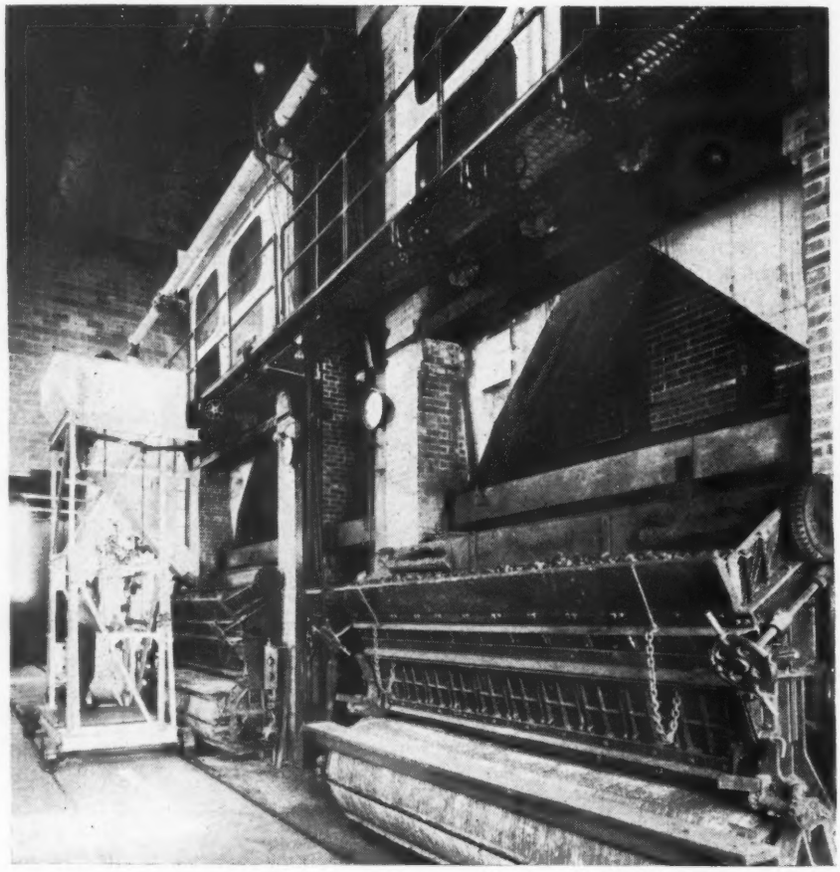
Blower to transport coal from tipple to power plant. Central State Collieries, Inc.

The condensate is returned to the boilers as feed water. The make-up water is from deep wells, processed by an evaporator heated with live steam. In this way, mineral matter does not enter the boilers. This process, together with continuous blowdown, makes boiler cleaning unnecessary except at long intervals. This system was put into operation under the supervision of commercial chemists, who check it occasionally.

Steam is provided by two 500-hp. Babcock & Wilcox boilers, clinker chill and Coxe chain-grate stokers with finger-type grate links having 10 percent straight-line air spaces between the links. Clinker chill and stokers are the same as at Antioch except that the clinker chills are made up with 4-in. tubes instead of 3-in.

These boilers are operated at a very low rating—about 125 percent. It probably is this low rating that accounts for the fine condition of boiler walls and the low maintenance.

The fuel, which is much smaller than at Antioch, is recovered from ½-mm. slurry. Recovery and preparation are by very different methods. Slurry from the bottom of the wet-wash settling cone is passed through a 48-in. Centrifugal & Mechanical Industries continuous centrifugal dryer, which dewaters it down to about 18 percent total moisture. The clay in suspension is washed out with the effluent, leaving a fuel containing 10.5



Boiler room, Central State Collieries, Inc., showing weigh larry and finger type grates.

to 11.5 percent ash. Approximately 60 tons of ½-mm. coal is thus salvaged per working day from an average production of 3,750 tons.

This centrifugally dewatered coal is fed through a wing feeder into the air current from a rotary pressure blower, which carries it 125 ft. horizontally to a bin at the foot of the storage silo, into which it is elevated. From the silo, coal is discharged into a lorry, weighed and emptied into the stoker hoppers, as at Antioch.

Prior to installing the centrifugal dryer, it was attempted to burn the raw slurry after piling it up to drain. This was as unsuccessful as was the early Antioch experiment. Two boilers would not carry the load one now carries. Fly ash was a tough problem. Three men could not dispose of it as easily as one now does with centrifugally treated coal. Even now, considerable fly ash collects in the base of the stack and has to be hydraulicked out to waste every few months.

Orient No. 1, C. W. & F. Coal Co., Orient, Ill.

An entirely different problem from the preceding two is the utilization of dry coal dust for boiler fuel. More than half this dust is too coarse to burn freely in suspension, as with pulverized coal, but special firing equipment burns it with rather marked efficiency despite conditions that are not perfect.

This boiler plant consists of six 410-hp. Wickes vertical water-tube boilers. All originally were equipped with Green chain-grate stokers using 1½x⅜-in. washed screenings. Later, four of these boilers were changed to Illinois Type T spreader stokers using aspirated dust from dry cleaners in the preparation plant. The dust is conveyed directly to coal bunkers in the boiler room.

This fine dust, a byproduct of Stump air-flow cleaners, is minus 48-mesh, 65 percent being under 100-mesh and nearly 40 percent being 200-mesh or smaller. It is nominally dry, having a total moisture of 11.6 percent, and flows readily down a vertical pipe from coal bunker to stoker.

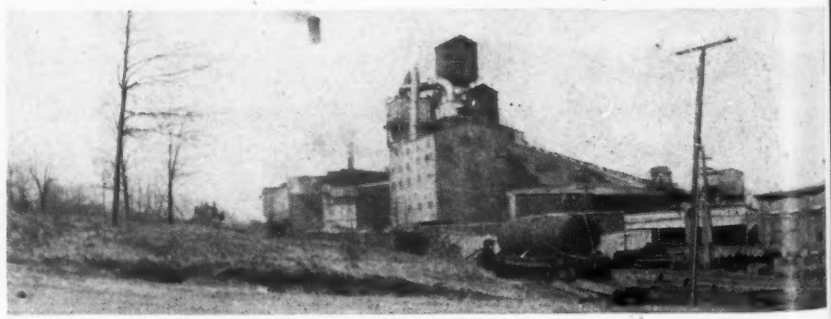
There is one stoker to each boiler. The dust is fed by a short conveyor into the air stream, which carries it into the furnace. This air flow, induced by two jets of steam, has a velocity sufficient to carry screenings to the back end of the grate. Much of the finer coal is burned in suspension. Coarser particles are automatically spread over the grate surface by a moving nozzle that directs the coal to every point of grate area. The furnaces are under light forced draft, which varies from 0.0- to 0.1-in. water gage, averaging 0.05-in.

The essential conditions for smokeless burning of fine coal in suspension are: coal ground to 200-mesh or finer; sufficient volume of air to burn all the coal; sufficient volume of furnace to prevent flame striking "cold" surfaces; turbulence of air so oxygen will reach every particle of coal.

The Type T spreader stokers in this plant are designed for less exacting conditions than those set forth. They do a very good job of burning a mixture of pulverized and granular coal.

Tests on these dust-fired boilers indicate that they carry a working load of nearly 175 percent rating and operate at an efficiency of approximately 71.5 percent. Under the conditions, this is regarded as a satisfactory figure.

The load on these six boilers consists of a 28x48-in. double-cylinder first-motion steam hoist, one 500- and one 300-kw. steam-driven d.c. generators, one 22x30-in. ventilating fan and heating the mine buildings.



Orient No. 1 Mine, Chicago, Wilmington & Franklin Coal Co., employs spreader stokers.

Princeton Mining Co., Princeton, Ind.

Designed to secure highly efficient combustion and maximum economy from dry 10-mesh waste coal, termed raw carbon, this steam plant differs materially from the preceding ones. Pulverized to minus 200-mesh, the coal is blown into a huge furnace space where it burns like atomized oil. There are no grates, so every particle of coal must be burned in suspension.

The coal comes from the dry section of the rescreening plant. In the event of a shortage, wet washed screenings may be substituted. It, too, must be pulverized to the same small dimensions. One advantage of pulverized coal is that much of the fly ash, because of its small dimensions, floats out of the stacks. Cinder melts into slag, which is occasionally broken up and cleaned from the furnace floor.

This steam-generating plant consists of four Babcock & Wilcox water-tube boilers. One is rated at 660 hp. and three at 500 hp. each. The rating of all boilers has been upped at least 15 percent by adding water linings to the sides and rear of the combustion space of each furnace.

The boiler walls were originally, and still are, hollow. Air drawn through these hollow walls for preheating is used to burn the pulverized coal. This increases boiler efficiency by reducing radiation losses and reduces maintenance of the walls by holding down the temperature. Even with air-cooled walls, upkeep is expensive. To hold furnace maintenance down, water linings were added.

These linings consist of vertical 3-in. tubes on approximately 8-in. centers reaching from near the bottom to the top of the combustion space. The tubes are connected into the water circulating system of the boilers. They increase the effective heating surface as well as protect the furnace linings from molten ash and erosion.

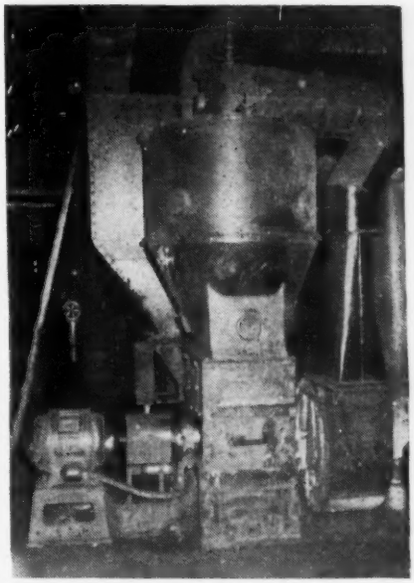
The raw carbon is moved from the stockpile by a clamshell crane to a conveyor system that delivers it to the bins supplying the five grinding mills. There are two Strong-Scott B-18 and one D-60 motor-driven grinding mills and one B-15 with steam turbine drive. These are hammer mills. The steam-driven mill is required so one boiler may be operated with all the generators shut down. The fifth grinder is a Kennedy-Van Saun ball mill. The ball mill is more expensive in first cost but lower in maintenance. The bars in the hammer mills require replacement about every five days, at a cost of $5 or $6 a set.

Grinding reduces the raw carbon to 200-mesh and finer. The pulverized coal is picked up by air suction and blown into the furnace, where it burns completely in suspension. It makes a hot flame, adjustable by regulating the flow of raw coal to the mill and air to the burner.

This plant has been operating since 1933. There is installed 7,000 kw. of turbo-generator capacity, half of which is required to carry the mine load. One 1,000-kw. turbine is driven by the exhaust from the mine hoist through a steam regenerator. This hoist handles 7,000 tons per double-shift day.

Because of the large unmetered use of steam for heating and the unknown consumption of the steam hoist, it is not possible to give the coal per kilowatt-hour or the boiler evaporation per pound of coal. However, comparison of the data in the table indicates this plant is doing a good job.

These examples in conservation of fuel values definitely demonstrate two things of interest to coal operators and their customers. First, a byproduct of regular coal preparation is not normally a usable fuel. Second, it can usually be made an economical fuel by removing the inert material by additional processing and the installation of special furnace equipment for burning the purified product.



Motor-driven hammer mill, Princeton Mining Co.

SALIENT DATA ON BOILER PLANTS BURNING FINE COAL

	Antioch Power	Orient No. 1 C. W. & F.	Central State	Princeton Mining
Number boilers	3	4	2	4
Horsepower	500	410	500	1 @ 660 3 @ 500
Type	Stirling	Wickes	B. & W.	B. & W.
Steam pressure	180	160	175	160
Superheat	150	None	None	450
Work rating	200%	175%	125%	100%
Stokers	Coxe	Shaking grate; Ill. spreader	Coxe	Pulverized coal
Grate area, sq.ft	160	92	135	None
Furnace vol., cu.ft	2,589	1,180	1,859	1 @ 4,380 1 @ 3,150 2 @ 2,880
Water walls	Clinker chill—two 3-in. tubes each side of grates, front to rear	Top of furnace	Clinker chill—two 4-in. tubes each side of grates, front to rear	Sides and ends of furnace
Draft, in	0.73–0.77	Stack draft, 1.25; at boiler outlet, 0.70–0.90	0.70	.....
Blower pressure	1.5	0.05 average	0.20–0.50	.....
Stack, ft	.....	175	210	184
Vacuum, in	Variable	.....	24	28
Fuel	Minus 1-mm. slurry	Minus 48-mesh dust	Minus ¼-mm. slurry	Minus 10-mesh raw carbon
Moisture	Stacked to drain; 16% total	Aspirated from dry cleaner; 11.6% total	18–19% total	Dry from tipple
Treatment	Washed on Plat-O tables	None	Through 48-in. C-M-I dryer	Ground to 200-mesh
Ash	8.38%	12.5%	11%	9.46%
Volatile matter	32.53%	.....	.....	.....
Fixed carbon	43.09%	.....	.....	.....
B.t.u. per lb	10,385	.....	10,000	12,900
Coal per year, tons	32,234	.....	.....	.....
Per month	2,686	.....	.....	2,456 (Oct., 1941)
Water per pound of coal	5.995	7.05	5.77*	7.04*
Generator capacity, kw.	10,200	800	2,750	7,000
Kw.-hr. generated	17,369,000 (1941); 1,622,500 (Nov. 1941)	.....	550,000 per month	816,800 (Oct., 1941)
Coal per kw.-hr.	3.71 (1941)	.....	4.00	.....
Coal per boiler—horsepower-hour	5.60*	5.09*	5.08*	4.90*
24-hour mine capacity, tons	.....	3,500	3,750	7,000
Shifts per day	.....	One	One	Two
Comments	Power only	Steam hoist—exhaust wasted; mine fan; two d.c. engine generators	Power for 1,500 REA customers	Steam hoist—exhausting to regenerator for turbine

* Calculated from data available and thus merely indications, as instruments are not installed for providing the data.

1¼-yd. shovel loading the third cut from the outcrop in the Lower Freeport, or "D." seam on the Holtz tract at Foxburg No. 1 mine.

THREE PITS

Even Production in Outcrop Stripping

Shovels Selected for F. B. Wood Outcrop Stripping in Northern Cambria County, Pennsylvania—Most of the Overburden Dug Without Shooting—Coal Delivered to a Mechanical-Cleaning Plant

TO SOLVE the big problem of obtaining uniform and regular daily production in stripping narrow outcrops in areas that have been mined largely from underground, the F. B. Wood Coal Mining Co., Barnesboro, Pa., operates three producing pits, loads not less than four days per week from each and has two pits always loading. Thereby 800 to 1,000 tons is produced each weekday. The operations of this company, owned by Frank B. Wood, attorney at law, Barnesboro, Pa., and under direction of his son, Frank B. Wood Jr., general manager, started in April, 1942, and represent the first stripping of consequence to be done in northern Cambria County.

The initial pit, which yielded 50,000 tons and was worked out by November, 1942, was the first experience of Frank B. Wood in strip mining. He had been associated, however, with underground mining off and on since 1914, when he opened a wagon mine. His equipment is now producing from a new pit, Foxburg No. 1, in West Carroll Township. At one of the other pits operated by his company the equipment is owned by Joseph E. Gross. The coal is sold and delivered to the tipple of an underground mining company which has mechanical cleaning. The haul from No. 1 pit, 1½ miles, is accomplished with trucks rented by the hour.

◀ From the top of the coal an outgoing ramp leads to a bench that dodges a water hole in the pit bottom. In the background, directly in line with the ramp, is the bank at the start of a new pit in the upper seam.

▲ Shown maintaining a road, this machine also is used for building new roads, cleaning off the coal top, moving equipment and some stripping on occasion.

◀ Fred J. Hogan (left), superintendent, and Frank B. Wood Jr., general manager, on the Upper Freeport, or "E," seam, being opened by the 1½-yd. shovel.

Foxburg No. 1 with Fred J. Hogan as superintendent, was opened in the Lower Freeport, or "D," seam, 48 in. thick. Recently, however, stripping has been started in the same territory in the Upper Freeport, or "E," seam, which is a hard-structure coal 42 in. thick lying 42 ft. above the other. To date, coal has been loaded only from the lower seam, which is clean except for a 1-in. binder 10 in. from the bottom. The overburden is a shale which, for the most part, is strippable with small equipment without shooting. The company does own a horizontal drill, however, and has had to use it a few times.

The available coal is principally that left at the outcrop after earlier underground mining. Old rooms sometimes are cut into but there is no water trouble because the seam has a slight general pitch and the pit is on the high side. From the standpoint of pit layout, there is little opportunity for departing from the obvious method of following the outcrop and then working back with successive cuts to the depth limit. In some cases, short-length cuts are made to shorten corners. With present equipment, 24 ft. is the maximum overburden that has been moved and 30 ft. is considered the limit that can be handled economically. The country is hilly and limits the stripping to an average width of 150 ft., with a maximum of about 200 ft.

Shovels Strip and Load

Two shovels do the stripping. One is a 1½-yd. Lorain 80 driven by a D-13000 Caterpillar diesel engine. It has a 30-ft. 8-in. boom and a 28-ft. stick. The other is a 1½-yd. Lorain 75B, originally gasoline but converted to diesel by installation of a Caterpillar D-11000 engine. Both stick and boom on this shovel are 22 ft. long. It loads seven hours a day and strips the remainder of the time. Occasionally, the larger shovel also does some loading. In neither case is the coal shot.

An all-around tool on the job is an Allis-Chalmers 15-ton Model L gasoline tractor equipped with Baker "Gradebuilder." It grades roads, cleans the top of the coal seam, pulls equipment, delivers supplies and does some stripping of top coal.

Pit haulage is on the coal to the extent of the stripped but unmined cut. From there it is on the bottom unless water causes trouble in low places. Those spots are dodged by grading ramps and making bench roads on the highwall. One Jaeger 2-in. gasoline pump has been sufficient to handle the pit water problem.

One shovel stripping all of the time and the other loading and stripping constitutes in this pit a combination which permits loading six days per week. A pit with but one shovel can hardly load more than four days per week since it takes two or three days of preparation each time for the loading.

SHAFT ESCAPEWAY

Made by Round Tube Integral With Lining

Separate 30-In.-Diameter Tube Installed in Shaft Lining at Federal No. 1 Mine as Escapeway—Tube Provided With Ladder Made Up of Round-Bar Rungs—Landings Made by Offsetting Ladder Sections

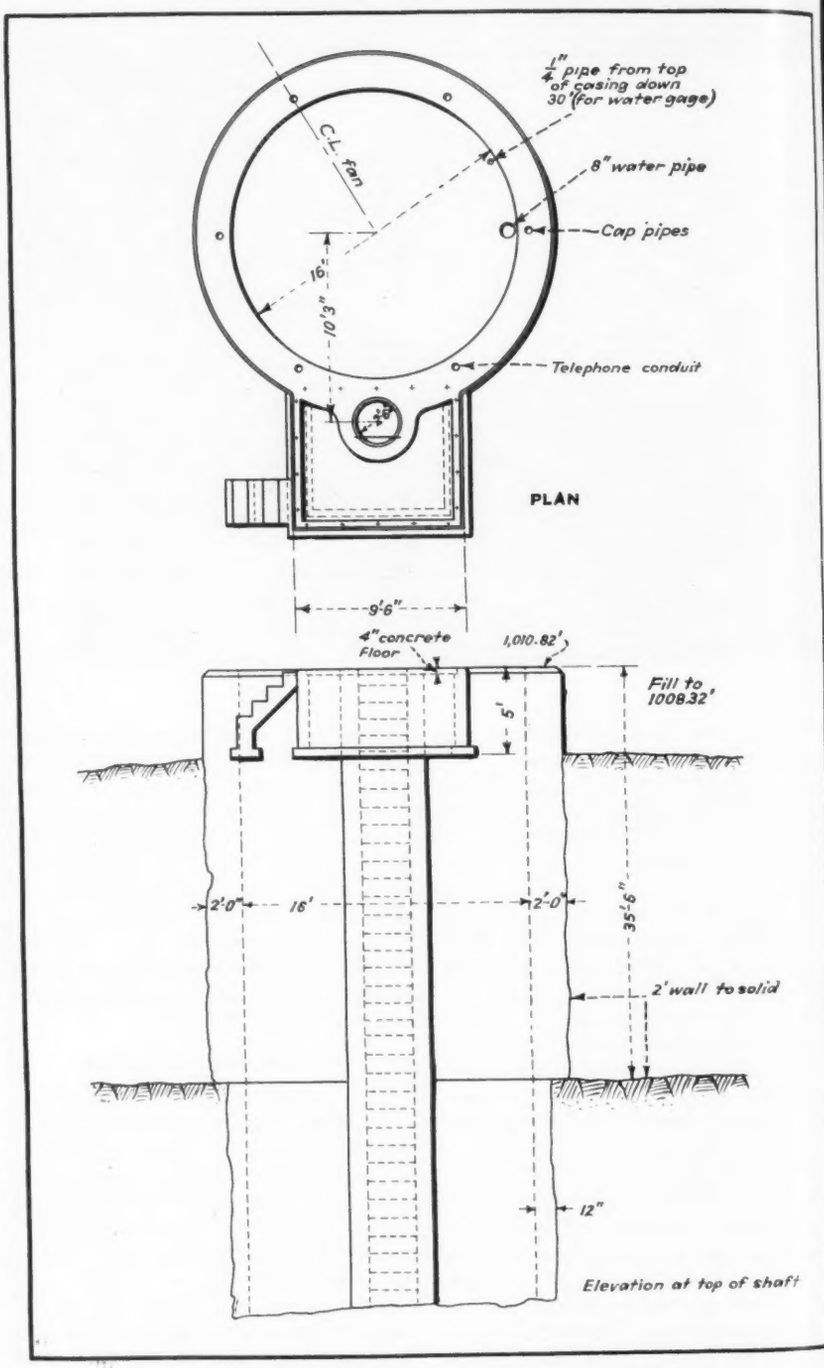
IN CONCRETE-LINED airshafts economical construction calls for a circular section, but to build into that a well-construted manway on air separate from the main current involves high expense and other complications. For an outlying airshaft and fan installation of fairly recent construction at Federal No. 1 mine, Grant Town, W. Va., the Koppers Coal Division hit on the unusual idea of making the manway a 30-in. tube containing a ladder with the tube surrounded by the monolithic lining. For the inside form and ladder-rung support during construction, 30-in. corrugated galvanized pipe was used. This, of course, remains in place.

The shaft has an inside diameter of 16 ft. and is 330 ft. deep from the top of the coping to the top of the eous. The ladder escapeway is provided with a small downcast circulation entering as leakage around the airlock doors at the top.

Clearance Is 24 In.

The corrugated galvanized lining is 16-gage steel. Ladder rungs are $\frac{7}{8}$-in. round steel bars set on $10\frac{1}{2}$-in. centers. Their vertical plane is 6 in. out from one side of the tube, providing 24 in. of body room on the climbing side. Holes in the corrugated pipe held the rungs in place during construction. The 24-in. clearance on the climbing side of the ladder is a safety feature in that a man can hardly fall by missing a hand hold and can rest with considerable safety by leaning back.

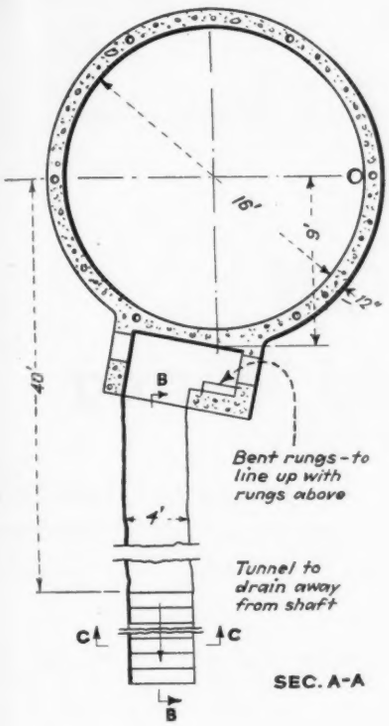
Landings are made every 50 ft. at points where center lines of the tubes are offset 45 in. first to one side and then the other. One landing is connected by doors to a water ring half way down. The bottom landing of the bottom ladder section is 15 ft. above the mine floor. The 4x7-ft. tunnel from this landing to a main intake airway includes a short section dipping 57 deg. and containing a stairway to mine level.



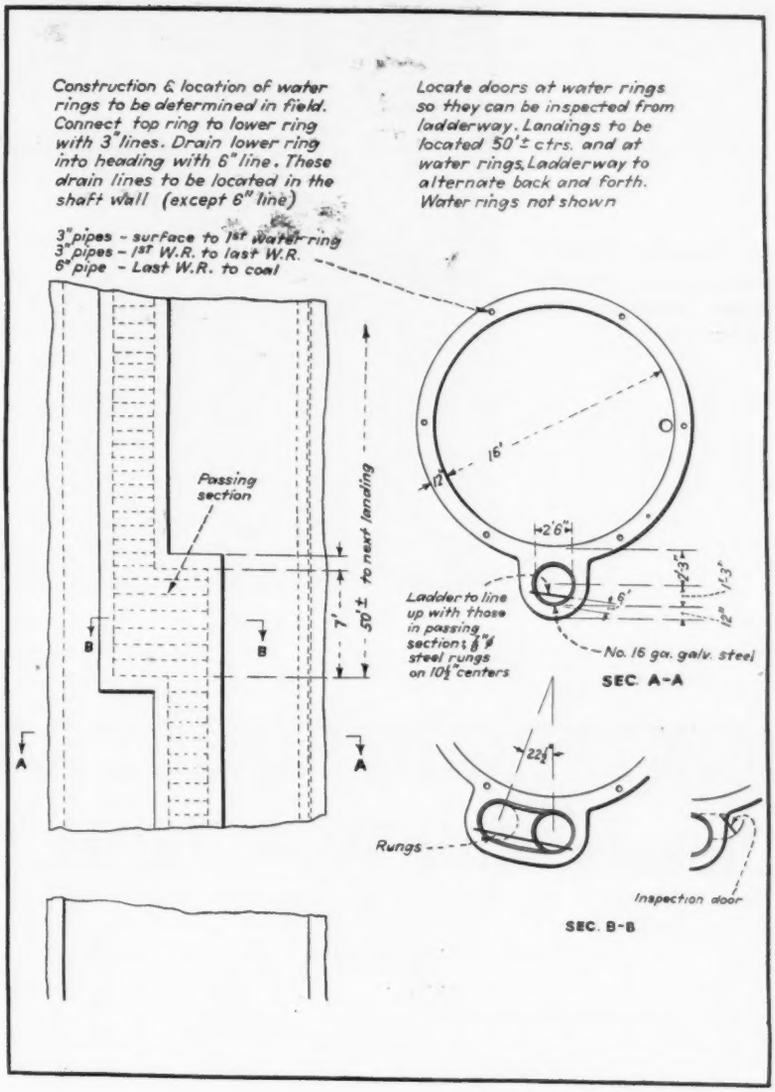
Top of airshaft, showing the manway tube and ladder.

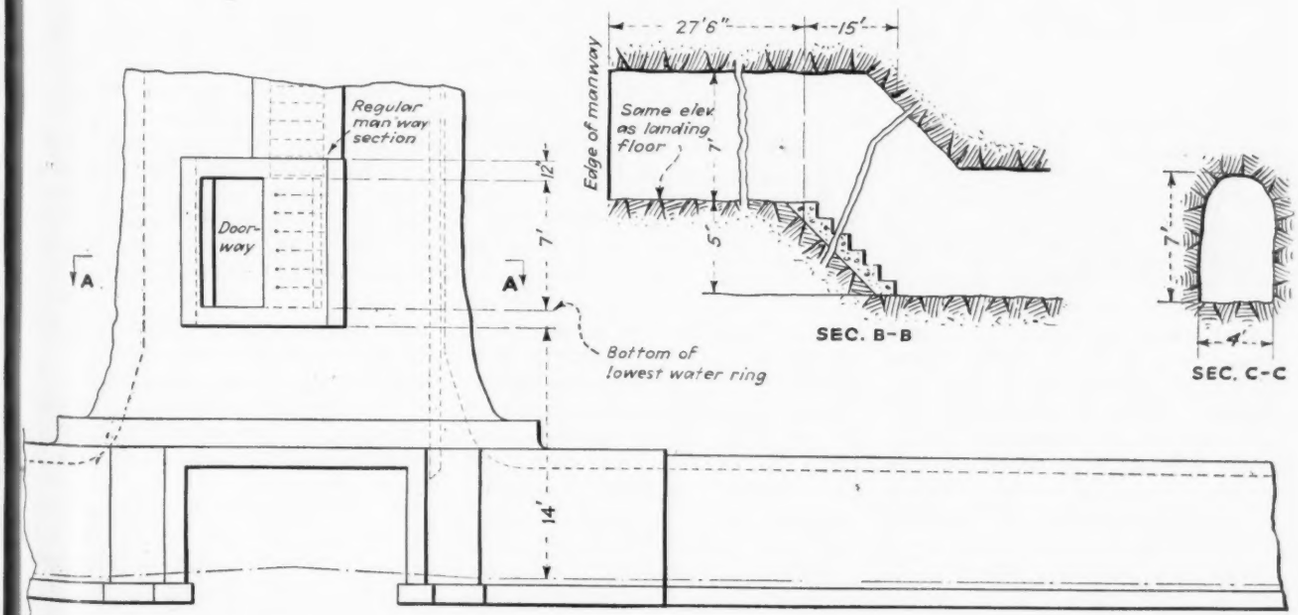
Offsets and platforms are provided every 50 ft.

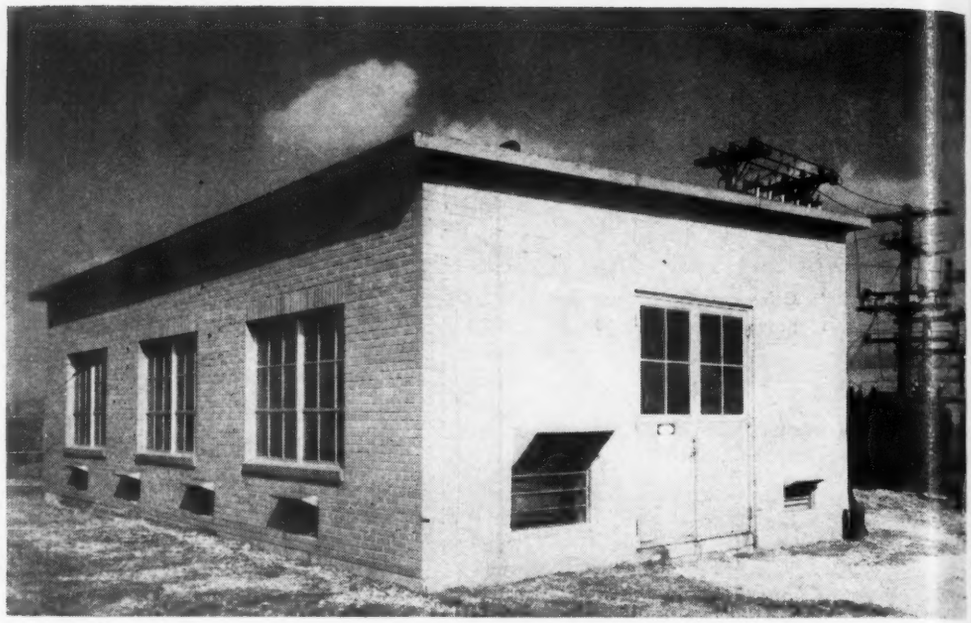
Lower part of shaft, including manway landing and the tunnel.



SEC. A-A


Construction & location of water rings to be determined in field. Connect top ring to lower ring with 3" lines. Drain lower ring into heading with 6" line. These drain lines to be located in the shaft wall (except 6" line)
Locate doors at water rings so they can be inspected from ladderway. Landings to be located 50'± ctrs. and at water rings. Ladderway to alternate back and forth. Water rings not shown
3" pipes - surface to 1st water ring
3" pipes - 1st W.R. to last W.R.
6" pipe - Last W.R. to coal
Passing section
50'± to next landing
7'
B
B
A
A
16'
12"
2'6"
2'3"
1'3"
12"
6'
Ladder to line up with those in passing section; 5/8" steel rungs on 10½" centers
No. 16 ga. galv. steel
SEC. A-A
22½
Rungs
Inspection door
SEC. B-B





This 20x35-ft. fireproof building houses the two 600-kw. rectifiers and transformers.

IGNITRON SUBSTATION

Closely Knit With Little Field Wiring

Breakers Permit Three Times Full-Load Current but Units Show No Strain—Field Wiring Reduced—Four Rectifier Substations Totaling 2,400 Kw. Now Serve Vesta-Shannopin Coal Division

By CHARLES R. DRUM

General Master Mechanic
Vesta-Shannopin Coal Division
Jones & Laughlin Steel Corp.
California, Pa.

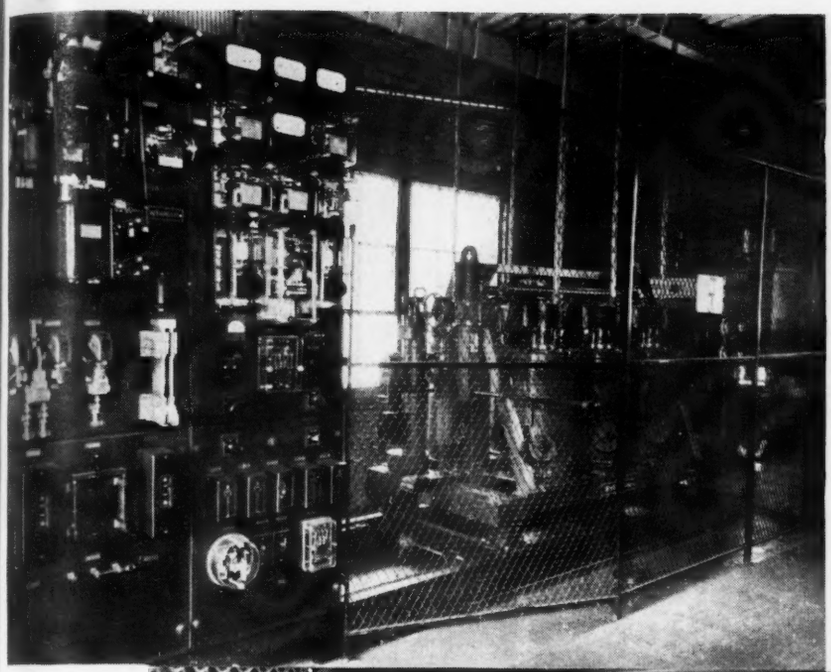
IN SELECTING the type of conversion apparatus for coal-mining service, a number of features should be given consideration. Important ones are: high efficiency at all loads, high overload capacity, reliability, minimum inspection and attendance, simplicity of installation and portability. Capacity, or ability to withstand without damage momentary overloads far beyond rated capacity, is of great importance. While it is realized that such overloads are undesirable, nevertheless they are unavoidable in coal mining, where large transportation units and heavy trains must negotiate adverse grades.

Based on past experiences and a thorough and careful study, officials of the Vesta-Shannopin Coal Division, Jones & Laughlin Steel Corp., selected ignitron mercury-arc rectifiers for a substation recently completed at the new Thompson airshaft, No. 5 mine, Beallsville, Washington County, Pa. The reasons for adding a substation were longer hauls and development beyond the top of the anticline where grades are against the loads.

The substation is made up of two Westinghouse pumped-type ignitron units each rated 600 volts d.c., 600 kw. full load continuously, 150 percent overload for two hours and 300 percent full load for one minute. Each conversion unit proper consists of six metal ignitron tubes, vacuum auxiliaries, heat exchanger and a.c. and d.c. switching apparatus, all mounted on a common steel base. Each three-phase main transformer (2,300-volt primary) also is on a steel base along with its incoming line oil circuit breaker.

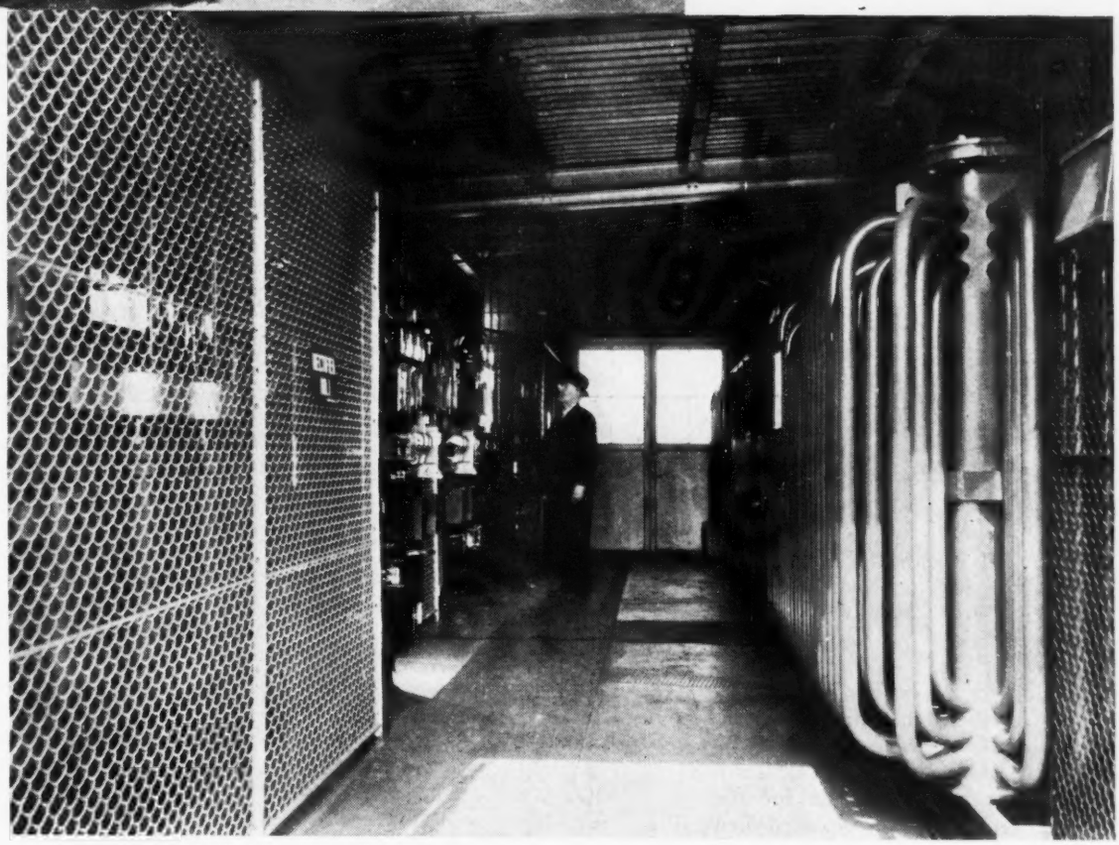
Operation is fully automatic, including load and remote-control features. The units operate in parallel with two other substations with a total of 1,800 kw. of motor-generator capacity. The tie is through 1,000,000-cir.mil feeders. Through remote control this new ignitron substation is under the direction of an operator at a manual motor-generator substation 11,000 ft. outby the ventilating shaft and new substation. A flasher indicating continuity of operation of the fan is installed in this manual station. If and when it shows a fan stoppage the operator can immediately, by the remote control, take the rectifiers out of service and kill all power to the then unventilated area.

A manually operated selector switch in the new substation makes it possible to choose either ignitron as the "preference" unit. That unit stays on the line all the time and also is the one that can be started and stopped from the manual substation 11,000 ft. away. When the load on



Panels, tubes, auxiliaries and heat exchangers—all on one base.

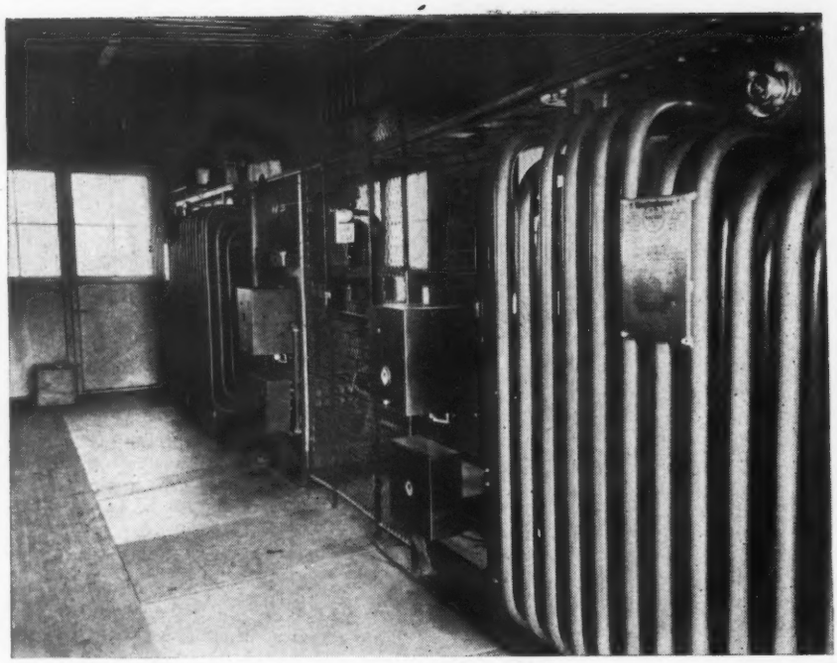
Looking in from the substation doorway, the rectifiers and panels are along the left side of the room and the transformers and incoming line switches along the right.

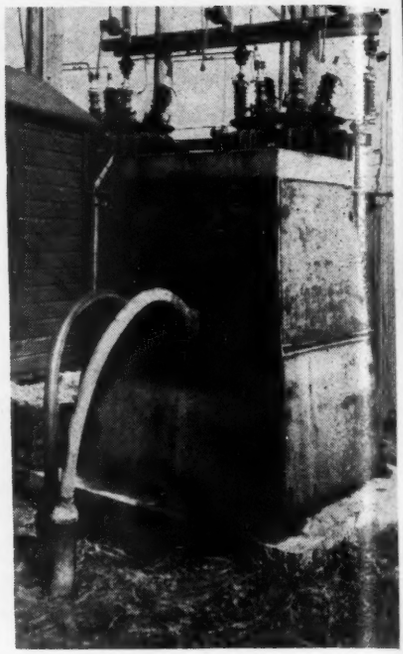


this preference unit reaches 150 percent full load rating for 5 minutes the other unit starts and stays on the line 15 minutes beyond the time when the total load on the substation drops to full rating for one unit.

Experience to date indicates that these ignitron units, each rated at 1,000 amp. full load, suffer no harm with the d.c. circuit breakers kept set to open at 3,000 amp., as has been the practice. Being over two miles apart, the manual and automatic substations operated without an automatic tie feeder breaker in the 1,000,000-cir.mil tie and feeder line.

Station wiring with this semi-portable type of ignitron equipment is reduced to a minimum and consists of incoming a.c. leads and outgoing d.c. feeder. For the double three-phase operation, connections to the anodes of the rectifiers from the transformer secondaries are made from ¾-in. pipe-size copper tubing supported from the ceiling by suitable insulators. Plug and socket type jumpers are used for control and auxiliary circuits. As the switchboard, rectifier and heat exchanger are self-supporting, they do not require accurate alignment, leveling or bolting in place on the substation floor. The latter is made only





Left—Transformers and their line switches on integral steel bases. Right—Concrete foundation and housing over the suspensions of the two 1,500,000-cir.mil positive rubber-sheathed feeder borehole cables.

reasonably substantial for the duty.

Cooling liquid now being used in the rectifiers (21 gal. each) consists of a mixture of Zerone (8 gal.) and water (13 gal.) which will protect against freezing down to minus 20 deg. F.

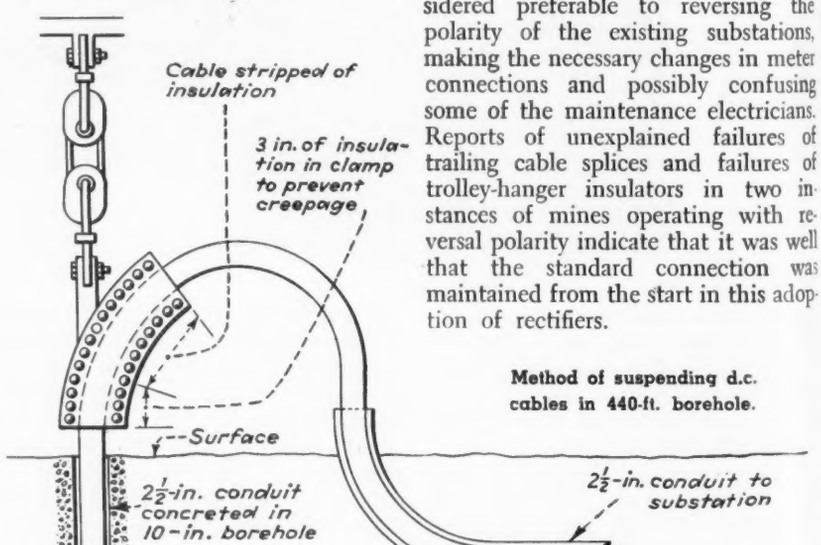
The house is brick, fireproof throughout, 20 ft. 5 in. wide x 35 ft. 5 in. long. The minimum ceiling height is 9 ft. 8 in. Openings in either end of the building take care of the exhaust air from the heat exchangers and are designed so they can be closed completely during cold weather, thereby circulating the warm air in the building and keeping its temperature at a satisfactory level. Sufficient openings with louvers and closing devices have been placed in the walls near the floor line to provide ample air circulation for the cooling system during the summer. In addition two 20-in. rotary louvers were placed in the roof to be used as conditions demand.

Entrances into the mine for the d.c. feeders are 10-in. holes drilled down through the 400 ft. of stratum overlying the coal. Three 2½-in. galvanized conduits were installed in each for the entire depth. As the stratum carries a considerable volume of water, the space surrounding the conduits was completely filled with grout to keep the water out of the mine.

The positive feeder for each unit is a single-conductor 1,500,000-cir.mil stranded hard-service rubber-jacketed cable (Simplex-Anhydrex) and the negative is a stranded bare cable of the same size. As indicated in the accompanying sketch, the positive suspension consists of a dead-end clamp and two strain insulators and fittings in series with the porcelains in compression. Should one insulator break the other will insulate for the circuit voltage. These dead ends, insulators and fittings were furnished by the Ohio Brass Co. Negative feeders are supported by the same type dead-end clamps and insulators.

With this latest substation the Vesta-Shannopin Coal Division now has in use four rectifier substations (six units with total capacity 2,400 kw.). The first installation (1938) was at the Nickeson slate-disposal shaft, No. 4 mine, and consisted of two General Electric tank-type 600-kw. units. The next was a Westinghouse ignitron at Shannopin mine, followed by one unit of the same type at Thompson Shaft. Then another was installed at Mine No. 4, Smallwood, replacing three 500-kw. engine-driven generators. The last was the second unit at the Thompson Shaft location.

All are 600-volt and in each case the tank or tube rack is insulated from ground so that the trolley can be operated positive, or standard polarity. Insulating the units was considered preferable to reversing the polarity of the existing substations, making the necessary changes in meter connections and possibly confusing some of the maintenance electricians. Reports of unexplained failures of trailing cable splices and failures of trolley-hanger insulators in two instances of mines operating with reversal polarity indicate that it was well that the standard connection was maintained from the start in this adoption of rectifiers.


Cable stripped of insulation
3 in. of insulation in clamp to prevent creepage
Surface
2½-in. conduit concreted in 10-in. borehole
2½-in. conduit to substation

Method of suspending d.c. cables in 440-ft. borehole.

COAL FOR WAR

Keynote of Cincinnati Meeting

Helping coal to do its wartime job was the goal of the 1943 Coal-Mine War Conference of the American Mining Congress, held at the Netherland-Plaza Hotel, Cincinnati, Ohio, July 19-20. Coal executives, engineers and operating men joined with equipment manufacturers and government officials in a far-flung discussion of war-production problems and how to solve them, spurred on by battle reports from fighting men from the far corners of the earth.

From manpower at the opening session to government operation at the annual dinner which brought the conference to a close, discussion ranged over coal's vital place in the war effort, machinery and equipment for coal mining, organizing for production, eliminating machine delays, conserving labor and materials, improving coal quality, creating better understanding of coal and coal mining, and mine safety. Strip-Mining sessions covered haulage, the characteristics of various types of stripping equipment, electrical equipment, maintenance and related topics. Special meetings and round tables provided opportunities for coal-mine purchasing men and manufacturers to go over their problems with War Production Board representatives, including A. S. Knoizen, director, mining division, and J. L. G. Weysser, chief of the coal section.

Government Operation—Public Relations

CARL E. NEWTON, Deputy Federal Coal Mines Administrator, told the annual dinner meeting of the American Mining Congress that if "unsettled conditions" continued in coal, he did not see how the industry "could reasonably expect to avoid progressive tightening of governmental supervision and control of mine operations." But, he added, "Secretary Ickes and I are resolutely determined to resist any trend toward nationalization of the coal mines."

Nevertheless, "we cannot afford to close our eyes to the facts. If this industry can achieve permanent peace in its labor relations, your apprehensions will soon be set at rest." But a continuation of unsettled conditions would be a different matter. "Government control would inevitably grow where conditions exist which bring public pressure for government action. Can we turn government control on and off with impunity?"

Mr. Newton pointed out that anti-strike laws had not prevented coal strikes in England and that government control there had grown to such a proportion that "today Great Britain's coal industry is not a free or competitive enterprise." In view of the fact that Great Britain has "trav-

eled far along the road to nationalization of its coal industry," it is natural to ask if "we Americans can afford to be complacent."

Mr. Newton warned against the consequences of the use of government funds to help operate the mines or to salvage current difficulties. Some operators, he declared, have already appealed for federal funds under threat of shutting their mines unless they were forthcoming. However, no money has thus far been advanced. "If Uncle Sam should open wide his purse to the coal industry, then the coal industry would wake up some day to find out that it is in hock up to its neck to Uncle Sam." Such action, he forecast, would be a "long step on the road to nationalization."

"I see no evidence yet, and I hope I shall never see any evidence, that the industry as a whole cannot fulfill its national responsibility for the production of coal without substantial use of public funds." Both Mr. Ickes and himself, Mr. Newton said, intend to continue to resist any effort to make the Coal Mines Administration "a Santa Claus to the industry."

Expressing the hope that a solution which would permit return of the mines to the operators was "not far distant," Mr. Newton observed that "the government's job is to keep the machinery of coal production running until such time as operators and mine workers can arrive at a solution of their differences which will enable them thereafter to cooperate together in the production of coal without the intervention of government machinery."

Reviewing the industry's accomplishments in the past year, Mr. Newton declared that prior to the present crisis it had done "a good job," as evidenced by the production of 580,000,000 tons of bituminous and 60,000,000 tons of anthracite in 1942. "This certainly does not look as if you were ready to fold up as a privately owned and competitively operated industry, or that the national interest requires that you become burdened with permanent government operation or control of your mines."

The owners of the coal mines are the people who can best operate and manage them, said Thomas J. Thomas, Associate Deputy Solid Fuels Administrator for War. "I will welcome the hastening of the day when your properties are returned to you," he declared. Coal mines in 1942 "did a job" and the credit goes to the leaders of the industry and the men who man the mines.

Conservative estimates indicate that some 25,000,000 tons of coal had been lost by work stoppages. As a result, Mr. Thomas predicted, those who had stockpiles would have to dig into them this winter for their needs. Mr. Thomas commended industry for heeding a Department of the Interior appeal to accumulate stockpiles and promised to take a "positive stand" to see that industries with stockpiles would not have to share their coal with others which had not profited by the department's warning.

Forty percent of the freight carried by railroads is coal. Consequently, Mr. Thomas urged manufacturers and operators of mines to integrate their shipping problems with the railroads.

THE KIND of public relations the industry achieves will be a measure of the success it will enjoy, declared Edward H. Walker, director of public relations, Anthracite Industries, Inc., New York. There is today a choice between repeating the history of the twenties and thirties and full recognition of the fact that production and labor are not the industry's only problems. "It must no longer blind itself to the fact that it has a problem in meeting and satisfying consumer requirements." The object of a public relations program is to make people want to do business with you.

Good coal is useless without good equipment, good equipment is useless without good coal and both combined are useless unless the public wants to do business with the industry. In promoting proper public relations, the

Gavel Wielders

GEORGE F. CAMPBELL, Old Ben Coal Corp., general chairman of the program committee, took charge of the opening session at the Cincinnati meeting. Presiding officers at later regular and special events were:

HARRY M. MOSES, H. C. Frick Coke Co., chairman, coal division, American Mining Congress.

GEORGE E. STRINGFELLOW, Thomas A. Edison, Inc., new chairman of the manufacturers' division, American Mining Congress, vice John W. Haddock.

W. E. E. KOEPLER, Pocahontas Operators' Association.

EVAN EVANS, Lehigh Navigation Coal Co.

S. W. BLAKSLEE, consulting engineer, Pittsburgh, Pa.

R. K. BEACHAM, Ayrshire Patoka Collieries Corp.

THOMAS C. CHEASLEY, Sinclair Coal Co.

IRVIN DAVIS, Hatfield-Campbell Creek Coal Co.

Carl E. Newton, deputy federal coal mines administrator—"determined to resist any trend toward nationalization."

George E. Stringfellow, Thomas A. Edison, Inc., new chairman of the manufacturers' division, American Mining Congress.

job is 90 percent doing and 10 percent telling. Anthracite Industries is helping the job along by an expanded research program, which includes studies of anthracite characteristics and development of better equipment in the laboratory at Primos. The design assistance rendered to heating-equipment manufacturers is but another phase of public relations. Foreseeing the manpower shortage that has developed in servicing anthracite, a telephone service book was made up by which a telephone operator can give a customer the right answer to most of the questions that come up in burning the fuel and handling the equipment.

By demonstrations and transmission of the facts to the press, radio and advertising men an interest has been created which is bearing fruit in favorable publicity. Even the beneficial use of anthracite ash on victory gardens has been publicized to reduce the customer's aversion to ash. Proper distribution to avert shortages has been intensively and successfully dealt with in the last twelve months.

Establishment of public faith and confidence by means of the press, radio and advertising is an industry "must," declared S. C. Higgins, secretary, New River Coal Operators' Association, Mt. Hope, W. Va. With due consideration of the public's interest, it also is necessary to cooperate in good faith with labor in protecting working conditions and wages. But labor must learn there is a limit to the costs that can be passed on to the public. Unwise administration creates a vicious cycle, bringing on inflated prices and criticism of both management and labor by the public.

Since the low production level of 1932, coal enjoys the advantages of public interest in coal through the development of automatic stokers with thermostatic controls, manufacture of nylon and additional discoveries showing the medicinal values in coal products. The time has come to end the defeats the industry has suffered because the public is unaware of the facts and how they affect the individual consumer.

R. E. Hobart and Evan Evans, Lehigh Navigation Coal Co., Lansford, Pa.

Harry M. Moses, president, H. C. Frick Coke Co.

Manpower and Its Efficient Utilization

SHORTAGE of manpower was termed a fundamental and increasing problem of the coal industry at the wartime conference of the American Mining Congress and in the opinion of one operator can be solved in one area at least only by the release of 10,000 experienced miners from the armed forces.

Unless there is an immediate remedy for the manpower shortage, Eugene McAuliffe, president, Union Pacific Coal Co., Wyoming, told the opening session of the congress, the Rocky Mountain area this winter will face a coal famine which will necessitate a reduction in railroad transportation.

Charles M. Hay, in his maiden speech as general counsel for the War Manpower Commission, pleaded for industry cooperation to help solve what he termed the "over-all manpower problem."

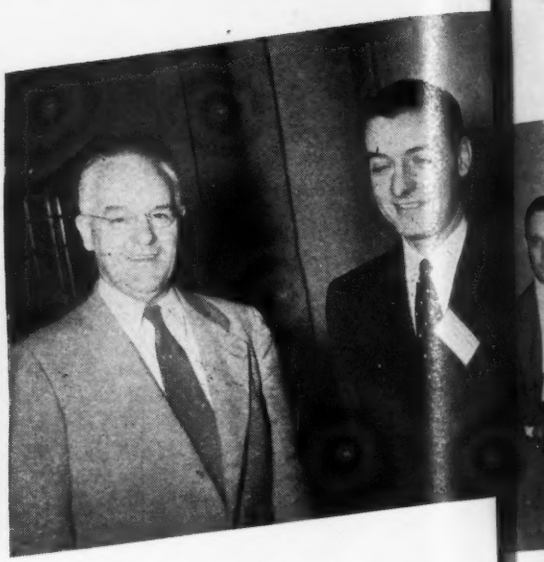
"The biggest question of the hour," Mr. Hay said, "was 'who shall do what?'" Lengthening of the work week, holding of men in their present jobs and training within industry were suggested as partial solutions to the problem. "We shall have to take every possible person from non-essential industry," he declared. "We must study to see what transfers can be made from industry to industry and from area to area. But we must remember that some of those now in essential industry may be called to the armed services."

The manpower problem, Mr. Hay told the congress, demands "cooperative thinking by government agencies and employers." A national labor draft law is a possibility, but Mr. Hay had no opinion on it. He warned against hoarding of labor, loafing on the job, and urged that absenteeism be reduced.

The entire manpower situation, Mr. Hay declared, rests on price control. "Unless this problem is solved, the War Manpower Commission and the War Labor Board too will be reduced to futility. Control of prices is vital. Solve it, or there is no escape from runaway inflation, governmental bankruptcy, and the possible losing of the war. Solve it, or we are sunk."

Mr. Hay predicted that by July, 1944, military requirements in the United States would be 11,300,000 men; munitions plants requirements, 11,600,000; other industry, 30,000,000; and agriculture, 12,000,000. At present the armed forces' strength is 9,300,000, with munitions plants em-

C. C. Conway, Consolidated Coal Co., Herrin, Ill.; D. D. Wilcox, Superior Coal Co., Gillespie, Ill.; C. C. Hagenbuch, Hanna Coal Co., St. Clairsville, Ohio.



C. W. Connor, Colcord Coal Co., Monicoal, W. Va., and E. H. Walker, Anthracite Industries, Inc., New York

ploying 10,000,000. Thus, within the year the armed forces and munitions plants will require an increase of 3,600,000 men. There is no hope, he declared, of obtaining help from the unemployed, since 8,000,000 persons have already been absorbed, leaving only 1,000,000 jobless and these in large measure are in the process of transfer from one job to another.

"Appalling" was the way Mr. McAuliffe described the labor turnover in his area, but he expressed confidence that production goals could be reached if the WMC would help the operators. He called a 7-day week an "unsound and unfair condition" and urged in its place an 8-hour day and a 6-day week.

Union Pacific has hired 95 women for work above ground and they have done such good work, Mr. McAuliffe said, that his hat was continually off to them. He urged immediate discharge of 500,000 government employees for work in industry.

Harry M. Moses, president, H. C. Frick Coke Co., Pittsburgh, Pa., and chairman of the congress' coal division, said the industry had "not been permitted the privilege of solving its own problems." He was confident that it could work out its difficulties and believed it could "look forward to a great many years of prosperity."

The industry, said Walter F. Schulten, assistant to the president, Pittsburgh Coal Co., has been caught between "increased production demands and increased military demands." It cannot compete with other industries in the labor market because of State laws governing age, health and length of service. "The responsibility will rest with the government," he declared, "if production falls because of the government's failure to make more men available."

Release of federal employees to industry also was urged by R. E. Salvati, vice president, Island Creek Coal Co., Huntington, W. Va., in a paper read by W. E. McQuail, of the same company. Salvati asked that 1,000,000 government employees be made available for industry or the armed forces. Use of women in mine work, he said, was being blocked by United Mine Workers' regulations. Absenteeism he called the "worst affliction of the coal fields."

The difficulty of maintaining mechanical equipment with shortages of manpower and the use of older men is tremendous, D. D. Wilcox, general superintendent, Superior Coal Co., Gillespie, Ill., told the congress. He cited unrest within the industry as a major cause of absenteeism.

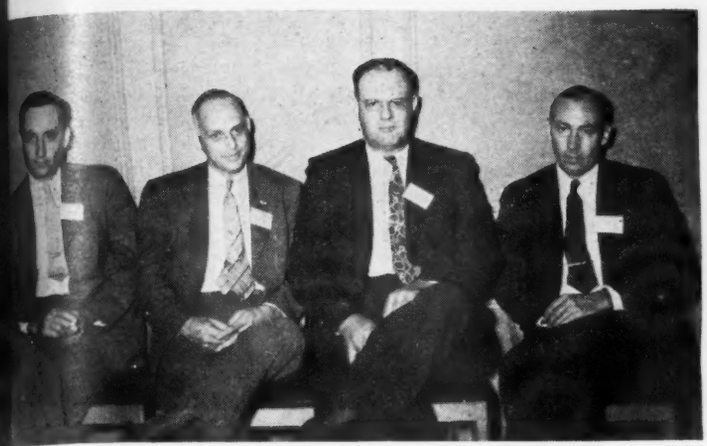
"Nine percent of our employees have been lost to the armed forces and it is fortunate that the figure was not higher, because there are no replacements for them." He found it impractical to hire women for coal-mine work and said the manpower shortage was further aggravated because the labor market was not open to management in Illinois.

Careful choice of men for work on loading crews must never be slighted, asserted John M. Johnston, vice president, Bell & Zoller Coal & Mining Co., Zeigler, Ill. Every new man should be interviewed by all those in supervisory authority. Some probably will know the applicant and can steer the company away from employing a misfit. Find out just what jobs he has performed—don't accept his broad declaration that he can do anything around the working face. Teach him from the start that he comes to the company with a definite promise to wear safety clothing and if he demurs don't let him enter your employ.

After the war started, the Bell & Zoller turnover became 20.6 percent per annum; it was normally only 10 percent. Fewer now are leaving. However, this scarcely spells relief, for though replacements do not have to be made so often, it is more difficult to find the men to fill vacancies that still occur.

At its hand-loading mine, stated Roland C. Luther, vice president, Peerless Coal & Coke Co., Vivian, W. Va., which is operated by men who are old as employees and still older as men and with the younger men drained off by the armed forces and to defense industries, the Peerless experience duplicates that of the entire Pocahontas field by which the mine is surrounded. From that field while working on a 5-day-week basis, 800,000 tons was being produced every week, but the output dropped to 781,400 tons, a decline of 18,600 tons on a 6-day week, and then to 695,000 tons, which would be only 568,000 tons on a 5-day basis. The Peerless operation lost 17 percent to draft and defense industries combined.

Deferments, at first, were never granted, but the losses to the armed forces have slowed down, partly (1) because of a greater recognition by draft boards and public of the needs of the coal industry, partly (2) because the cream of the men already have entered into the armed forces and partly (3) because company offi-



M. E. Spears, Morgan Coal Co., Indianapolis, Ind.; E. C. Anderson, Kensington Steel Co., Chicago; R. K. Beacham and R. H. Swallow, Ayrshire Patoka Collieries Corp., Indiapanolis, Ind.

Thomas C. Cheasley, Sinclair Coal Co., Kansas City, Mo., and Harrison Eiteljorg, Morgan Coal Co., Indianapolis, Ind.

cials now understand better the procedure of the draft boards. His men, said Mr. Luther, had an absentee record of 8 percent. Now it is 13 percent.

An educational campaign had been established to imbue the mine worker with a sense of his obligation to work both for his fighting sons and for the men who supply the wherewithal by which these sons are enabled to fight. Foremen were assembled at meetings at which were discussed diagrams showing the relation of daily production to quotas. A company honor roll was erected listing the men who had joined the armed forces. Their photographs also were exhibited.

Whenever a man took time off, his foreman interviewed him the first day on which he returned to work to find out why he was idle and to admonish him as to his duty to his country, his friends and kin in the armed forces. If he took a day off in the next two weeks he received a letter from the general manager, and if he took another day off during the following two-week period his name was posted on the slackers' list. But about 30 percent were often absent on the night shift and Saturday night's run was almost a farce, so many men failed to show up for work that night.

Turnover, said James Riley, superintendent, Piney Fork mine, Hanna Coal Co., St. Clairsville, Ohio, was 100 percent in a year for mine workers and also for the office force and 60 percent for the supervisory force. An attempt had been made to train foremen in the correct way to handle labor. Loading crews had been reduced from 17 men to 14 and even 13 by blasting coal and stone together. Efforts had been made to harmonize the foremen. Harmony with men is like lubrication with machinery; without them, both will burn up.

Providing Quality Coal for War Purposes

COAL QUALITY must be maintained and improved to retain the new markets which the war has thrust upon the industry, declared E. R. Keeler, president, Franklin County Coal Corp., Chicago. With improved cleaning and screening facilities, there exists a much greater opportunity to retain markets than during the period after the first world war. Uniformity was placed practically on a par with low ash content by Mr. Keeler.

Answering the question of "Why dustproof now" he showed that unless people continue to want to buy coal, dustproofing started after the war will be too late. A dustless product must be furnished now to prevent a post-war shift to other fuels. Other factors, such as the development of smokeless stoves, call for an upgrading in quality. Mr. Keeler stressed the importance of continuing to furnish a clean high-quality coal, which is one of his company's cardinal principles.

Carroll F. Hardy, manager, Fuel Engineering Division, Appalachian Coals, Inc., suggested in discussion that perhaps some of the losses suffered by coal in past years were due to a lack of super-salesmanship of the type exhibited by the dealers in the non-solid fuels. In addition to maintaining a high standard of coal preparation he thinks it just as important to place before the public the true facts regarding general problems of the industry—for instance, showing the public some of the fine bathhouses to counteract photographs recently published showing the begrimed miner taking a bath in a washtub beside the kitchen stove. In a brief reference to recent standardization he expressed the hope that industry would be able to retain the simplified list of sizes after the war.

Citing experience at Indiana strip mines, William Caler, preparation manager, Enos Coal Mining Co., Oakland City, said there can be a 10 percent variation in coal breakage as a result of variation in methods of shooting, stripping and moving the coal to the preparation plant. Heavy stripping shovels working on top of the coal, as compared to a dragline

stripper working on top of the overburden, can cause much breakage and loss of coal. The number of times the coal is handled, such as direct by truck to the tipple or through a transfer station and railroad cars, is another factor.

Enos washes its coal in a 5-cell air-pulsated jig with hydro-dynamometer feed and refuse indication to aid the operators in maintaining proper adjustments. Standards of size tolerances and ash content have been established and the product is carefully held within those limits. A.S.T.M. standards are followed 100 percent in sampling. Pit conditions govern ash content very noticeably.

Selective mining at the mines of the Rochester & Pittsburgh Coal Co., Indiana, Pa., said John J. Snure, production manager, is performed by machinery specially designed to meet the needs of the situation, and has enabled his company to produce by all-mechanical methods cleaner coal than was obtained by hand methods. The plan follows the dictum of modern production-line methods of "special tools for special purposes."

In a mine, which Mr. Snure designated as No. 1, recovering the Double Freeport seam, a 12-in. bone-on-coal sandwich is cut by a combination double-bar cutting and gobbing machine at one fell swoop out of the face cross-section. It consists of 10 in. of bone with 1 in. of top coal on the top and 1 in. of the 42-in. main coal seam at the bottom.

This cut is 29 ft. 4 in. wide and 9 ft. deep. After the machine has made its cut and gobbed its rock, it is pulled out of the way, and muckers clean out the kerf, sweeping both the face of the cut and the bottom in front of the face clean. This fine dirt is thrown into the gob, 1-in. boards being placed behind the roadway posts to keep it off the track. Other boards are placed so that when the good coal is shot, it will not mix with the front line of gob. The bottom bench is then drilled on top of the 1½-in. binder with a track-mounted self-propelled drill and shot with permissible powder.

In the mine designated No. 2, the same Double Freeport seam is extracted. In production sections, the 2½-in. cannel coal, the 18- to 20-in. coal below it and 6 in. of the 10-in. bony underlying this are left up. They make a good roof and none would meet market demands. A caterpillar-mounted top cutting arcwall makes a cut 26 ft. wide and 8 ft. deep, taking 4 in. of the bone and 2 in. of the main bench. This kerf is cleaned and the face of the cut and the floor in front of the cut are swept, the material being deposited in the gob. Where crosscuts are turned, the dirty cuttings are loaded into shuttle cars and transported to abandoned areas. The coal is then drilled directly above the bottom binder with portable electric drills and shot with permissible powder.

Self-propelled rubber-tired drills have been purchased and will replace hand-held drills as soon as delivered. The coal is loaded into 3½-ton storage-battery shuttle cars by a track-mounted mobile loading machine.

At present, the high-ash and high-sulphur top coal is not recovered but a modern cleaning plant is planned, so that at least a part of the top coal could be blended with the main bed and a good product could still be maintained.

In the development section, the top coal is mined and as much as can be used is sent to the central power house for fuel. What is left is cleaned and blended carefully at the face with the main bed. The top bench in this work must be taken down to make height to within 300 ft. of the ends of the headings for the high 10-ton mine cars there used. The kerf is cleaned, the face swept and all the dirty cuttings stowed behind gob boards. The main coal is drilled on top of the bottom binder and the top coal drilled under the cannel bone and either shot down and blended with the main bed or shot after the main coal is loaded and then put in separate cars. The coal is then loaded as in the production sections. When the drawslate is loose and must be removed, it is held in place until the top coal is loaded and then dropped and gobbed behind roadway timbers.

The mine designated as No. 3 operates in the Upper Freeport seam, which consists of 5 in. to 14 in. of blackjack, 34 in. of coal with 7.70 percent ash and 0.82 percent sulphur, 1½ in. of binder and 3½ in. of bottom coal. The 34 in. of byproduct coal must be loaded separately. The bottom coal is salable in the steam market and, as heading height is a big consideration, the bottom bench is loaded out in a separate cycle. The two loading cycles are synchronized, for there are five to eight conveyor crews loading on one mother belt. Furthermore,

E. R. Keeler, Franklin County Coal Corp., Chicago, and A. U. Miller, Solid Fuels Administration, Washington, D. C.

Joseph Pursglove Jr., Pursglove Coal Mining Co., and Charles B. Baton, Greensburg-Connellsville Coal & Coke Co.

dirty cuttings and any blackjack that may fall have to be handled.

The seam is cut in the bottom binder with a shortwall machine with special effort to remove thereby all the binder. The kerf is carefully cleaned and all dirty cuttings are thrown in the gob. The coal is drilled just under the blackjack also so that that material stands up until the coal is loaded on chain and shaker conveyors which carry it to a mother belt, which in turn transports it to mine cars at the loading points on the flat headings. After this coal is all loaded out, bottom coal is lifted and loaded in the same manner in separate cars.

A fourth mine is operated in the Eagle seam and it produces metallurgical coal, which, therefore, must be more than ordinarily clean and of uniform analysis. The top 8 in. is drawslate, then follows 11 in. of bony (65 percent ash and 4.50 percent sulphur) with 41 in. of clean coal (ash 4.75 and sulphur 0.69 percent). Hand-loading produced irregular and high analyses with high costs because, due to the slow speed and the heavy overburden, the 20 in. of refuse had to be handled.

With mechanical operation, the headings are driven their full length before rooms are started. Then production begins at the far end and the rooms are laid out 25 ft. wide on 40-ft. centers. The 11 in. of bony is cut out by a track-mounted double-bar cutting-and-gobbing machine which places 85 percent of the cuttings in the gobs on either side of the roadway. The machine makes a 12-in. kerf 9 ft. deep and 25 ft. wide.

The working place is cut from right to left, and the 8 ft. of drawslate drops in the kerf behind the cutter bar. After the full cut is made the bit chain is reversed and the cutter bar moved from left to right, sweeping out cuttings and drawslate. The kerf is then cleaned with brush and shovel and the drawslate, with the rest of the bug dust, is put in the gob by the loading machine and by hand.

Coal is drilled exactly on the bottom with a portable hand-held electric drill and shot with the slowest permissible powder obtainable. Gob is kept far enough back from the face that none will be mixed with the clean coal.

This system of selective mining was shown by actual average analysis on 100 railroad cars to have produced coal, at an economical cost, ¾ to 1½ percent lower in ash than by hand-loading. By the rapidity of extraction that it permitted, it further made it possible to control the roof.

Selection of seams and locations was recommended by Neil Robinson, Robinson & Robinson, consulting engineers, Charleston, W. Va. In Great Britain, operators were meeting their problems of selective mining of beds having two benches of dissimilar character by loading one bench on the top band of a belt and another bench on the bottom band, from which it was diverted by a plow before reaching the pulley.

T. H. Latimer, United Electric Coal Cos., Chicago, Ill.

Frank G. Smith, Sunday Creek Coal Co., Nelsonville, Ohio.

Conserving Time, Labor and Materials

KEEPING equipment in condition for the day-by-day grind gives the manager and his mechanical aides a problem, declared A. K. Hert, general manager, Snow Hill Coal Corp., Terre Haute, Ind., in a paper read in his absence by Fred Beiler, general superintendent. Before the war, the mine ran four days a week. Now it runs six days, so the wear and tear as measured in time is 50 percent greater and would be in effect even more if not closely watched.

A lost-time report of a midwestern mine showed that in the operation of seven loading machines 7.84 percent of the whole loading time is lost, or 127 shifts (more exactly 53,158 minutes) per year. Causes of lost time, in percentage of the total, are:

Awaiting arrival of cars	48.74
Machine repair delays	20.62
Wrecks	9.89
Electrical and cable troubles	8.74
Power failures	3.16
Miscellaneous	8.85
	100.00

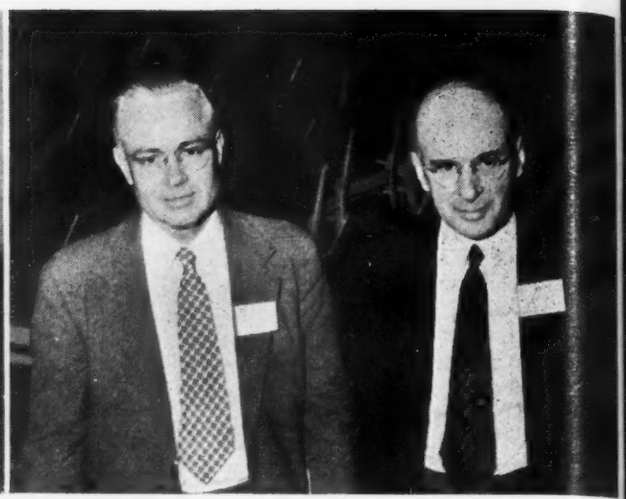
Delays may be caused by many insignificant things: a low place in the track that should be lifted, a tool partly covered that should have been left visible and in a known spot or a jack left behind that should have been with its machine.

Main attack for the saving of time should be expended on car supply—which accounts for almost 50 percent of the total time loss—explained C. C. Ballard, electrical and mechanical engineer, New River Co., Mount Hope, W. Va., in discussion. Too often motormen wait for a few more cars even though with more the locomotive will be overloaded, thus losing time in the wait and also because of reduced speed.

To reduce loss from breakdowns a mine should have not only a timetable for making thorough inspections and repairs but also a method of training its men. The public schools should educate boys for the mines rather than away from them. For effective operation, adequate voltage at the working face and d.c. sectionalizers are essential.

Some 60 percent of the total replacements of mechanical and electrical parts on mining machinery result

W. A. Porter Jr., and W. B. Pratt, Dakota Collieries Co., Minneapolis, Minn.



J. M. Johnston, Bell & Zoller Coal & Mining Co., Zeigler, Ill., and J. G. Crawford, Valier Coal Co., Chicago.

from neglect, abuse and breakage, rather than natural wear, said Joseph Pursglove Jr., president of the Pursglove Coal Mining Co., Morgantown, W. Va. This is an estimate based on experience, and in his paper on "Conservation of Material" he first outlined educational factors contributing to reduced waste in maintenance and then briefed a number of shop methods which conserve certain materials and parts.

Educational classes for bosses and workmen were offered by Mr. Pursglove as the only hope of correcting the ignorance responsible in the main for the breakages and maintenance delays and parts wastage cutting so deeply into the war effort. In one instance, only two or three men out of a crew of 15 or 16 electricians could readily read the wiring prints covering the complicated controls of a loading machine. Mr. Pursglove strongly advocated cooperation among the operators in a district in promoting educational programs, but warned that results do not come immediately. It may be a year before the program is earning its own way, but that is all the more reason for starting immediately.

In the central shop for one large northern West Virginia coal company, the university cooperates in putting on a course in maintenance of machinery. About half of the students have been from the smaller companies in the district. The school has also trained so many welders that there is no longer any shortage in that skill.

Among the suggestions for maintenance savings were: arcweld filling of locomotive tires and steel wheels, metallizing to reclaim shafts with worn fits, saving all of axles and shafts as stock in making new shafts in

Lester E. Briscoe, Ayrshire Patoka Collieries Corp., Oakland City, Ind.

smaller sizes and welding together pieces of trolley wire to make new long lengths. Possibilities in the conservation of other materials include buying scrap steel beams for use as headers instead of cutting up good lengths of steel rails, getting all rails out of abandoned sections, use of adequate mechanical post pullers to recover timbers and installation of treated timber.

In rail welding by the electric-arc and gas-torch methods to save angle bars and bonds, Mr. Pursglove pointed out that experience indicates the need for caution if the track is in a wet place where proper ballast is not provided. After a year and a half or so, joint breakage may be experienced.

Less shaking of the rolling stock is one great advantage of welded track, stated Victor Zeni, superintendent of maintenance, Pursglove Coal Mining Co., in discussion. There is far less leakage of coal from certain types of cars, a great increase in car bearing life and much less trouble with all parts of the locomotives. Reviewing maintenance methods, Mr. Zeni declared that he has found that men want to prevent the waste often encountered but just don't know how or when to do the job that would effect a saving. When properly instructed they are more efficient, save materials and keep everybody happy.

Poor lubrication of a machine was likened by Mr. Zeni to bad blood in a person. Things can't be right unless corrective measures are taken. Metallizing he characterized as a well-placed shim. Its saving in shaft recovery is about 55 percent. The shop scrap pile should be kept in neat order so that the different materials and sizes are readily seen and quickly available. No pieces of shafting as large as 2 in. in diameter and as long as 1 ft. should be scrapped but instead used as stock for making new shafts.

Never before was there so much need for an educational program, said William Cunningham, general superintendent, Linton-Summit Coal Co., Linton, Ind., in continued discussion of conservation of materials. His favorite comment to men at the mine is that they break everything but the tonnage record. Good training is contagious, however, and will move along if given a little push.

Recovery of timber has great possibilities. In New Hope mine, such recovery has been boosted to 50 percent. At Glendora, improved recovery methods have cut timber cost in half. Mine-car bolts are straightened and rethreaded for use again. No matter

W. E. E. Koepler, Pocahontas Operators' Association, Bluefield, W. Va.

W. J. Jenkins, Consolidated Coal Co.; Eugene McAuliffe, Union Pacific Coal Co.

how badly bent, track spikes are straightened for reuse. To date the company has reclaimed over 100 kegs. The bent spikes are driven into a square hole or slot in a steel bar. Then, the straightened spike is driven out by driving another crooked one in from the opposite side.

Lack of properly trained foremen and lack of proper tools to do a job result in large time losses, said Mr. Cunningham. This need for conserving the workmen's time is one of the big problems of the present. He would like to reduce time waste to the point where, in a 7-hour shift, a man would put in 6½ hours of useful work.

Economies in track construction and labor efficiencies resulting from using fabricated instead of ordinary track material in mines was the subject of a paper by C. C. Hagenbuch, chief mining engineer, Hanna Coal Co., St. Clairsville, Ohio. It took, he said, 4.55 times as much time to lay 40-lb. steel rail on wood as on steel ties, and 3.30 times as long to recover the rail thus laid. To install a No. 2 turnout on wood ties took 1.76 times as long as on steel ties, and recovery took 1.47 times as long.

Roof falls, declared Frank G. Smith, general superintendent, Sunday Creek Coal Co., Nelsonville, Ohio, from structural weakness and weathering; the latter from temperature changes, moisture and oxidation. Guniting sometimes fails to assure against weathering. A less expensive method was spraying the roof with paint which put on a coat preventing the oxygen in the air from affecting the rock and moisture from expanding it.

Unlike gunite, paint sprays do not destroy their own efficiency by the water used in the spraying, for the sprayed paint may be of a nature that, in application, cannot injure the rock. Such painting should be carried into the crosscuts or the cutting effect of moisture will spread into the heading. Where roof is shot down, the coating should be applied to the drawslates exposed along the ribs above the coal bed, and immediately after the first application a second should be made to fill in pinholes and areas that the first application had failed to seal completely. Costs in two mines have been as follows:

	Per Square Foot "A" Mine Cents	"B" Mine Cents
Labor of scaling	1	8
Labor of spraying	1	1
Material used	7	1½
Supervision of work	1½	1½
Totals	10½	12

At the Beech Bottom mine of the Windsor Power House Coal Co., Windsor Heights, W. Va., commented D. F. Welch, chief engineer, the 1-in. thickness of gunite failed for some distance from the portal. It was necessary to introduce a 4x4-in. mesh reinforcement with 2 in. of gunite. It was giving excellent results and the 1-in. material farther in the mine was standing well.

Saving Manpower Through Safety Measures

SAFETY has a new appeal during war times when men are scarce and cannot perform all the work that needs to be done, said E. R. Price, general superintendent, Inland Steel Co., Wheelwright, Ky., but in normal times there has been other and ample incentive to induce the operator to keep his mine safe. Recently, operators have been required to introduce all the provisions detailed by the U. S. Bureau of Mines and designated as merely "tentative" by those who formulated them, and these newly demanded expenditures are being pressed just at the time when it is difficult to get the materials needed for any reconstruction the rules demand. Many of the recommendations call for changes over which the operator has no direct control and which are due to frailties of the employee, his disposition to take a chance and his indisposition to use caution and safety provisions. From many of the accidents thus caused, the safety precautions taken by the operator cannot protect the employee.

Accelerated production is the cause of the increase in accidents not only in coal mining but in all industry. Because of this and because all casualties retard our war performance, every accident must be rated as a war casualty. In the United States casualties of all kinds increased 8 percent from 1941 to 1942.

The miners declare, said Mr. Price, that shifts should be limited to two daily and that three shifts cannot be made safe, for they provide no idle period for repair and maintenance. The war is the cause of some safety problems. Men absent themselves or are drafted, and new, often inexperienced, men must be employed who may know neither the nature of the work to be done nor the local hazards which accompany it. Men must be hired who are physically such as would at other times be rejected.

Why absenteeism has increased despite the war incentive Mr. Price cannot explain, but the increase in casualties is more explicable. Worries about relatives—perhaps sons at the front—may create inattention and add to the accident roll. A man distraught with anxiety is a poor risk. Also, there has been a tendency not to discipline men, because discharged, laid-off or disgruntled men do not help increase output. True, this is, in some ways,

a wrong viewpoint; surely it is better to fire or lay off a man than to bring him out on a stretcher. Vocational training is making headway and will correct inexperience in time, but it may be a year before it will begin to perform that task.

All accidents, even highway casualties per traveled mile, have increased since the war began, asserted John E. Jones, safety director, Old Ben Coal Corp., West Frankfort, Ill. Twice as many highway accidents have occurred per mile of travel despite slower speeds and fewer vehicles on the road. Something explainable only by psychology, and not by physical conditions, is the cause of these accidents. Operators and foremen used to think that it was the miner's sole duty to take care of his life. Today, so much has been said as to the responsibility of the employer that the miner believes he has no obligation to protect himself against accident. Yes, in moments of stress, fear does operate to make any man protect himself but only when the adrenal gland discharges; then the action is physical rather than mental. He does not argue himself into safety; danger causes him instinctively to seek it.

Dust content, declared Rodney H. Honaker, safety director, Guyan Eagle Coal Co., Amherstdale, W. Va. in a paper read by F. F. Jorgensen, labor commissioner, Northern West Virginia Coal Association, Fairmont, W. Va., is best measured by use of the midget impinger. Ninety-five percent of the dust is to be found at the coal faces as the outcome of blasting, loading and cutting, with the last the principal offender. The shortwall machine produces the least dust of all coal cutters; the quantity depending on the location of the cut and the quantity of coal being torn loose.

Water on the cutter bar will reduce the dust created, especially if a wetting agent is provided. A spray should be placed where the bits enter and leave the cut. It is thought that the finest spray should be used where the cutter bar emerges from the kerf. To reduce dustiness coal should not be used for track ballast and, where there is no methane, 65 percent of incombustible should be added to the coal, with more where methane is found. At the opening of the session, John J. Snure stated that the Rochester & Pittsburgh Coal Co. set 5,000,000 particles per cubic foot as the maximum concentration of dust permitted at its mines.

Improving Efficiency in Strip Mining

"EFFICIENT and planned haulage are one and the same thing," declared C. W. Woosley, general superintendent, Pyramid Coal Corp., Pinckneyville, Ill. Seventeen years of experience with 36-in.-gage steam-operated track and eight years with truck haulage under conditions where they could be compared brought the statement that his company had not been able to improve rail costs with trucks.

In 1931, a straightaway single track with passing sections gave way to a circular track layout with entering and exit inclines at the two ends of the pit. This increased tonnage by 30 percent with one-way travel. This No. 1 pit, with an 8-mile round trip, has produced 1,200,000 tons per year.

In 1935, after investigating automotive haulage in other properties, trucks were introduced to displace standard-gage steam rail haul in No. 3 Pyramid pit. Truck motors that did 100,000 miles in other properties, did not stand up for Pyramid. Springs and other parts broke and wore out. Tires lasted 5,000 or 6,000 miles.

In the intervening years, truck builders have made great strides. Tires now last 20,000 or 30,000 miles. In 1940, diesel engines were substituted for the original gasoline engines. "Performance justified the change." With a 12 percent boost in labor cost, cost of coal has been reduced.

The Pyramid company had a part in this improvement by building and maintaining good roads. Washery gob makes a good road for Pyramid, but like materials do not work successfully at some other mines. The uneven coal surface in the pit is the worst part of the truck road. Regardless of how it must be done, good roads are a necessity for successful truck haulage.

Under certain conditions trucks will be cheaper than rail haul. Mr. Woosley sets the dividing line between truck and rail haul at between three and four miles for a round trip under conditions at the Pyramid mine.

In a lengthy discussion, George F. Baton, Pittsburgh, Pa., favored steam or electric rail haul and decried the use of liquid fuels for mine power, insisting that coal miners should promote the manufacture of coal-burning power equipment and the discovery of new uses for coal. He departed from the subject to warn of the coming wave of restrictive legislation against strip mines from economic and landscaping points of view "for the good of the whole people."

With supply sources 600 to 2,000 miles from the mine and with correct items frequently not procurable, W. B. Pratt, treasurer, Dakota Collieries Co., Minneapolis, Minn., related the methods used to keep a variety of equipment "producing every day."

Two steam shovels, a home-assembled cutting machine for the 16-ft. coal seam and a rail haulage system made up the important equipment. For the most part this equipment was repaired and kept in operation by materials salvaged from outdated steam thresher engines of mogul size. In earlier days, a "smooth-tongued" salesman had literally filled that country with these outfits which the coal company "brought up wholesale at scrap figures."

Everything usable, or that could be forged or machined into usable shape, was saved. The refuse was sold as scrap. They built boilers, pulleys, elevator buckets, shafting, conveyor sprockets and what have you. Even wood bearings have lasted two years.

To protect from Arctic cold, water pipe was buried 5 ft. and made secure from freezing by a perpetual fire of slack coal on the surface.

Their slogan is: "Use it again and again, then make something else out of it."

Three new control devices, applicable to electric shovels and which promise more work with lower maintenance cost, were described in detail by Lester E. Briscoe, electrical engineer, Ayrshire Patoka Collieries Corp., Oakland City, Ind.

These apply to the voltage control of generators driving either or all the motions of the shovel. They are: Amplidyne, Rototrol and double Ward Leonard. Their function is to obtain a more rapid response of generator voltage and a definite limitation of overshooting, resulting in an increased speed of work and less shock.

Due to the simplicity of these devices and to the considerable reduction in relays and other control parts as well as the very small current used in the actual control circuit, reliability is increased and maintenance greatly reduced. Mechanical maintenance also is cut.

Each type has been applied to strip-mine shovels so that operating experience is available. Discussion brought out that the cost is approximately $2,000 per motion to which it is applied.

"The advantages of draglines for stripping are becoming more and more recognized each year," declared Harrison Eiteljorg, general manager, Morgan Coal Co., Indianapolis, Ind. These advantages can be summed up about as follows.

1. Reach and traveling ability permit a dragline to handle heavier overburden and to take wide cuts. Not as fast as the small shovel, the same machine as a dragline will carry 50 percent more dirt in each bucketful.

2. Operating on the highwall or bench, it does not interfere with loading and hauling in the pit, allows free action in the pit and is able to dig a large part of the available time.

3. Where several disconnected pits are involved in the same operation, it can move quickly from one to the other—a great advantage.

4. Mobility permits it to do the development work necessary in the average coal-stripping project; ramps into the pit, roads, drainage ditches, levees and other uses, including ability to reach and clean up slides.

The Morgan Coal Co. uses draglines exclusively at all its mines, preferring them to shovels. One advantage of the walking dragline is its light bearing pressure. "The bearing pressure per square inch of even the largest walking dragline is less than the bearing pressure of most small crawler-type machines." Diesel drive is preferred for small units.

"The design of the dragline bucket is most important and must . . . vary with the type of overburden it must handle": narrow, with four sharp teeth for medium hard shale; wide for rock or chunky material. After extensive experiments, all dragline buckets are now made with teeth parallel to the bottom of the bucket. That reduces tooth breakage and cleans the coal surface better. Light bucket weight contributes to pay load and coal tonnage, worth the more frequent rebuilding of the bucket.

All factors must be studied and restudied when opening a new property. If the box cut is in heavy overburden and a new dragline is bought, "it may be wise to order and use a longer boom and smaller bucket in the box cut and later remove a section from the boom and increase the bucket capacity."

Sketches were presented to illustrate typical stripping problems solved with a 3-yd. dragline with 80-ft. boom.

"The operation of large draglines to date in the strip fields has been confined to three main methods: tandem operation by machines on the coal behind large shovels, working on a bench on the highwall side, also in tandem with a shovel; and dragline stripping alone," said T. H. Latimer, United Electric Coal Cos., Chicago.

Tandem operation increases the height of overburden which may be economically stripped. In lower or moderate overburden, the total yardage also is increased. In both cases more coal is produced at a higher cost. "A dragline with bucket size comparable to the shovel with which it is working in tandem will give but 40 to 60 percent of the efficiency of the shovel and at an equal annual cost."

A recent one-year period of operation of a 14-yd. dragline in tandem with a 15-yd. shovel showed a per-yard dragline cost of 190 percent over the per-yard shovel cost, increasing the total cost by more than one-third. However, market and other conditions justified the operation.

In a mine operating a similar shovel in over 50 ft. of overburden, a 7-yd. dragline on the waste bank rehandling spoil increased shovel yardage 40 percent. Since the operation of a 7-yd. shovel will not run over 60 to 75 percent of a 14-yd. shovel, the added cost per yard would be but 20 percent, and pit congestion is removed.

"In at least two large mines 12- and 13-yd. walking draglines operate successfully from a highwall bench, casting the top portion across the pit and behind the shovel spoil."

A dragline operating on the highwall or on a bench will not at any time be forced to swing a full arc of 180 deg., as will a machine in the pit, and yardage can be increased to 70 or 80 percent of the production of a shovel of equal bucket capacity. Spill in the pit is negligible, there is little roll to rehandle and congestion and passing in the pit are eliminated.

All this doesn't look too good for tandem operation, but it is not always so. Problems are seldom alike and selection of the proper stripping method must give consideration to all conditions. History is now being made with the two new 25-yd. draglines at Northern Illinois Coal Co.'s mine at Wilmington, now producing about 500,000 cu.yd. per month each.

C. W. Woosley, Pyramid Coal Corp., Pinckneyville, Ill., and Paul Weir, consulting engineer, Chicago.

S. W. Blakslee, consulting engineer, Pittsburgh, Pa.

W. A. Staab, West Virginia School of Mines, Morgantown, W. Va., and E. R. Price, Inland Steel Co., Wheelwright, Ky.

THE FOREMEN'S FORUM

Room Roof Subjected to Complex of Stresses Being Not a Beam but a Very Thick Slab

Roof in a Room Hangs in Reversed Curves From Sides and Ends—Thus the Stresses Are Directed to Every Point of the Compass and Breaks, Being Perpendicular to Stresses, Vary Similarly in Direction and May Follow Slab Stresses Rather Than Rock Joints

By R. DAWSON HALL
Engineering Editor, Coal Age

IN PREVIOUS ARTICLES published in this department—April, p. 86, and June, p. 84—it was shown how drawrock being gripped by overburden around the edges of a mine excavation is what is known as "fixed" plate, or slab, and is protected by the fact (see Fig. 1): (1) that over large areas of the lower surface of it it is under a binding, cramping stress that holds it together instead of tearing it apart; (2) that, in another large area, the stress, though of a tearing nature, varies from zero to a maximum figure; and (3) that in the worst location of all, at a mere point (see A in Fig. 1), the stress, considering only the short span, is only a third as great as the tearing action would be on a free slab which has to span an opening of like size without the advantage which this one has of being gripped firmly by the pillars by which the opening is surrounded.

It was explained also that the drawrock is most favorably protected just where coal has to be mined or hauled, and so makes a better showing than could be expected of so frail, thin and unsatisfactory a slab as the drawrock usually is.

Compression Is Roof's Best Friend—To give an idea of the frequent weakness and unreliability of rock, it may be said that the building code of New York City allows sandstone a crowding or compressive stress of half a short ton per square inch, but does not provide for any stretching or tensile stress whatsoever. The engineers don't believe stone is reliable, and it is unfortunate indeed that mining men have to repose a little faith in it, though all of them prefer to trust it as little as possible. Mansfield Merriman, in "Mechanics of Materials," 10th edition, on p. 17 declares that steel for building should be made four times as strong as any steady stress it will have to bear (and more times as strong as any sudden stress or any blow it will encounter), but when he figures on the strength needed for stone he says that it should be fifteen times as strong as any steady stress it may have to experience. In other words, the factor of safety of steel under steady stress shall be four and that of stone under a similar condition shall be fifteen.

Room Has Long and Short Spans—In a room, we may visualize many roof spans—several parallel spans from rib to rib, several parallel spans from the face to the pillar at the room neck, to say nothing of the spans from corner to corner. At first sight, the second group of spans, because they are so long, might be considered more likely than the first to cause breaks in the drawrock, but the sides of the room and the posts support the spans of this group and change that situation. If the room roof were not tightly held at the sides and were merely held tightly at the ends, it would (1) have binding areas along face and neck as shown in Fig. 1, (2) a tensional area in between these areas, and (3) a maximum stress at face and neck, with (4) a maximum stress half as great half way between those two points of support, but the actual condition is more complicated than this, as will be shown later.

Long Span Has Big Sag and Maximum Stress—Suppose the span from face to neck is 270 ft. long, which is the length of a 300-ft. room with 30 ft. for neck. If the width of the room is 40 ft., a relationship different from that illustrated in Fig. 1, the first span will be 6.75 times as long as the second; so if help is not received from ribs and posts, the sag of the long span will be 2,076 times as great as the sag of the short span, for the deflection is as the fourth power of the span, and the maximum stresses in the long span will be 45.56 times those in the short span or as the square of the ratio between the two spans. That, offhand, seems a convincing argument for marking the end and start of the room, as in Fig. 1, as the location of maximum stress. It certainly would be the most stressed point if the roof had no side support and were held only on its ends. The difference may be illustrated by recalling the fact that the lid of a long box could readily be staved in if it did not extend over the sides and if it were not nailed firmly to those sides.

Analogy of a Network With Cross and Longitudinal Beams—It is the short cross spans that tend to assure the long spans of its freedom from breakage and reduce its binding and tearing stresses until they themselves succumb. Some idea of the stresses can be obtained by the following device. It will be imagined that the roof consists of a network consisting of narrow beams loaded down, of course, over the pillar edge. They will be laid in the transverse (crosswise) direction from pillar to pillar and will be overlaid in the longitudinal (lengthwise) direction with similar beams resting on these throughout their length. As the latter sag readily, they will rest their weight on these cross beams.

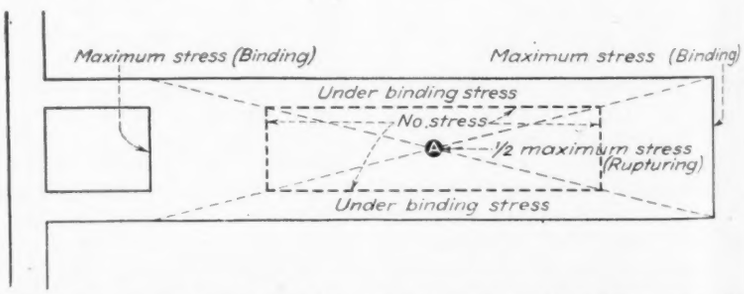


Fig. 1—Room as viewed from below showing area under binding stress, the line of no stress, the area with stress ranging from zero to maximum stress (rupturing) and point of maximum rupturing stress. This, however, would be true only if the longitudinal spans are unaffected by the cross spans, which is never the case and their interdependence profoundly modifies results, how greatly depending on the relation of length to width of room.

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No Bending-Moment Stress on the Long Beams Near the Rib—The long beams laid along the ribs on either side of the room will be so securely supported by the cross beams at the rib that from one end to the other they will not be able to sag at any point, so, there being no deformation, there can be no bending-moment stress in these long rib beams. Note that the stress if it existed would be in a lengthwise direction; that is the beams would tend to be torn apart by stresses pulling lengthwise of the room or crushed by stresses also in that direction, but in this instance there is no stress.

Cross Beams Heavily Laden by the Long Beams—The cross beams, being under the long beams, will be loaded by them and will therefore have a greater stress than they would have if they were not so loaded. Their stress will be transverse and therefore at right angles to the stress that would occur in the long beams if they were allowed to sag. The semi-umbrella of the transverse beams will be shortened but what there is of it will be made more effective by the increased pressure.

What This Involves in Taking Down Roof—Note that if you were taking down roof at the rib, the roof would fracture along the rib more readily than it would toward the face, for the stresses are dragging transversely away from the rib or pushing transversely toward it, and there are at the rib no stresses dragging or pushing at right angles to the transverse direction.

Spinal Longitudinal Beam Sags Considerably—In the spine of the room, however, the cross spans will not be as stiff as at the rib but will be sagging considerably, and the longitudinal span will sag down onto them and will load them down so that they will sag the more. This will permit the spinal longitudinal to sag markedly but not as severely as if the cross spans were not present to help to hold up the spinal beam.

The other longitudinal beams will have stresses and strains in accord with their position. The spinal longitudinal beam will have a longer semi-umbrella than it would have if it were not for the support of the cross spans.

Turning the Lattice Over so as to Study the Cross Beams—Having studied the longitudinals, let us now study the cross beams. Suppose the cross beams are placed on the longitudinals; that is, as it were, the lattice is turned over. It will be necessary to bind the cross beams to the longitudinals wherever they intersect, because otherwise the longitudinals would sag more than the cross beams and part company with them. The face and neck cross beams will be held up in this instance by the longitudinals because, at the face and neck, the longitudinals will be held down by the weight of the overburden and will be horizontal at those points.

How to Scale the Roof—With no deformation, there will be no transverse bending moment stresses, so a scaling bar inserted along the spine will break the rock along the face and there will be no tendency for the rock to break toward the rib, for at the face there will be no stress in that direction. These facts indicate the correct way to scale the roof and the manner also in which coal will tend to fall when shot.

Thus the transverse and longitudinal stresses alike will be absent in the corners of the room but they will begin to establish themselves as they leave the corner, so the semi-umbrellas may be said to start at the corners. The side and end semi-umbrellas do in fact cross each other, making the roof in the corner doubly tight. The spinal semi-umbrellas will be the most extensive or, may one say, more umbrageous than any other. In the halfway station of the room the stresses will be considerable. The central cross beam will be dragged down by the spinal longitudinal to which it is attached.

What the Figures Show—Fig. 2 shows the net or latticework with the cross beams under the longitudinal beams, the whole being viewed from above the lattice. Another view, which is not provided in the text, with the longitudinal beams below the cross beams readily can be visualized, but clamps of some sort must be inserted where the several beams cross each other or the longitudinals will sag away from the cross beams. Fig. 3 gives a suggestion of the lines of no bending-moment stress when all factors are considered. Frankly, it is not plotted in accord with calculations, and if these were made the locations of the lines would change with every variation in the ratio between room length and width.

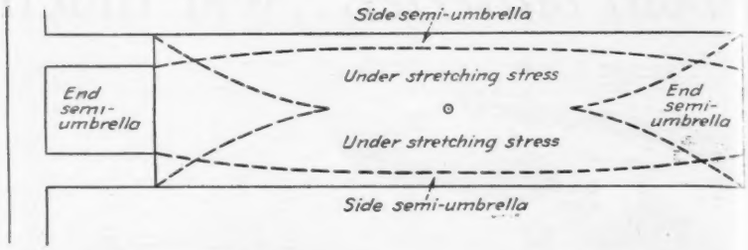


Fig. 3—Slab showing the compression area as determined when the mutual reactions of lengthwise and crosswise beams have been considered

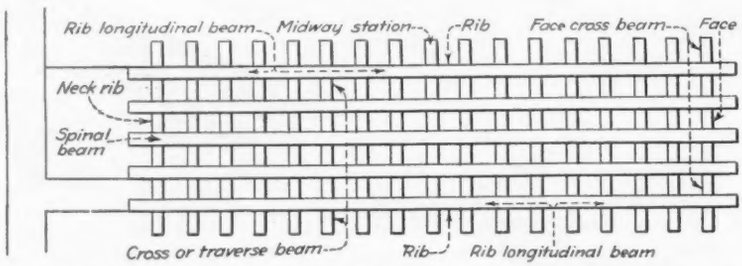


Fig. 2—Slab replaced by network of beams, so as to aid in visualizing the stresses lengthwise and crosswise the room.

Pattern of the Stresses—It will be noted that there are lengthwise and crosswise stresses in the same slab and, as these vary in relative value, they form compound, or resolved, stresses running in different directions each from a separate point, the directions depending on these relative values, which values change also with the extension of the room, the position in the room and the weakness and the demolishment of the rock by stresses, so the ultimate stress pattern is quite complicated and near the halfway station the compounded, or resolved, stresses are likely to be at 45 deg. or about that angle to the direction of the rib or the direction of the face. Thus, the breakage at the rib or face or at a point short of either may be far from parallel to the bounding lines of the excavation.

Laws of Stress Versus Roof Joints—Probably where the roof has any degree of strength, fracture will follow more closely the laws of dynamics than the direction of roof jointing, for the breaks in strong materials occur usually at right angles to the stretching stresses. Thus a study of these stresses at various times in the life of a room may be rewarded with some indications of the best means of preventing breakage. The pattern of the stress is greatly complicated by the flexure taking the form, as has been noted, of two reversed curves at right angles, the rock in both the intersecting spans having on its underside first compressive stresses, then stretching stresses and then compressive stresses. Yet in this jumble of stress conditions some system may be found helpful to those who would direct the labors of timbermen.

Unfortunately, the end of the room in time may become its middle and as the room extends and accordingly the stress increases it may prove best to make what finally will be the area at and near the midway station able to sustain the stresses to which that area ultimately will be subjected. The stresses at the face of the room also may indicate where and what temporary props should be erected and what measures taken. As with all studies, where they ultimately will lead cannot be told prior to their development.

The Ten Vital Rules for Wire Rope Care

1. Select the size, grade and construction of wire rope best suited for your equipment. If in doubt, we will help you make the selection.
2. When wire rope is installed, unreel or uncoil correctly to avoid putting twists into the rope.
3. Do not apply full load to a new wire rope. After a new rope is installed, operate the equipment with minimum load for a few cycles.
4. Do not overload your wire rope. Avoid shock loads by applying power uniformly.
5. Lubricate your wire rope at regular intervals. Wire rope is a machine, composed of many working parts. When operating around sheaves and drums it requires lubrication to reduce frictional wear. Periodic lubrication also prevents corrosion.
6. When not in use, wire rope should be stored in a dry place, protected from weather and acid fumes. Relubricate if temporarily removed from service.
7. Inspect your sheaves and drums. When these are worn so that new rope will not seat with proper clearance, they should be regrooved or replaced. Pinching in the grooves will ruin a wire rope.
8. Check the alignment of sheaves. Avoid unnecessary rope wear against flanges of sheaves.
9. Avoid cross winding on drums. And as far as possible, avoid over-winding.
10. Inspect your wire rope, end fastenings and equipment at regular intervals. Look for signs of unusual rope wear and abuse, and remove the cause. If caught in time, this means increased service.

Send for Free Wall Chart and Booklet

These ten rules are outlined and illustrated on an attractive wall chart, 15 in. by 21 in., printed in color and mounted on heavy cardboard. Send for a copy to be placed for ready reference where wire rope is being used.

Every user of wire rope can get a lot of good ideas from this book, "Valuable Facts". It's packed with easy-to-follow instructions that will help you avoid common errors of handling and care that shorten rope life. Order as many copies as you need.

What every wire rope user should know

THE well-tested rules for wire rope care are simple. The only difficult thing about them is to get your operators to follow them consistently—under all conditions. That's especially important right now when your ropes are being worked harder and for longer periods than ever before.

There is nothing delicate about U·S·S American Tiger Brand Wire Rope. It has strength, toughness and long life built into it. Its flexibility, its resistance to kinking and snarling, the fact that it is relaxed and inert makes Tiger Brand Excellay Preformed always easy to handle. But like any other good product, Tiger Brand needs good care—and must have it—if you want your rope to perform efficiently and last as long as it should.

So this year, make doubly sure that your operators understand that wire rope supplies are not unlimited, and that every care must be taken to make rope last as long as possible. It's common sense anytime—today it is a patriotic duty.

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
San Francisco
United States Steel Export Company, New York
For Anthracite Service: Miners Bank Building, Wilkes-Barre, Pa.

Excellay Preformed

UNITED STATES STEEL

STATE-BOARD QUESTIONS

Mine Foremen's Quiz, West Virginia*

The following questions have been selected from those included in "The Mine Foreman's Guide," used as the basis for examinations in West Virginia. The answers given in the guide, which normally are quite brief, have been supplemented by comments and data, which the editors of Coal Age *hope will be of assistance to those interested in these subjects. The numbers given the questions in the guide follow each in parentheses thus (ventilation, 128, etc.).*

Intake Vs. Return Haulage

Q.—How does application of the exhaust system of ventilation promote safety in haulage? (Ventilation, 37.)

A.—Wherever the exhaust system of ventilation is provided, the haulageway receives fresh air.

[In some mines, the haulageway is ventilated by fresh air, even though the force, pressure or blowing system of ventilation, and not the exhaust system, is used. To achieve this a door or doors are put in the drift mouth or in the shaft, and air is forced into the drift or shaft behind the door by a blowing fan. (Fig. 1.) This may be termed "inverted force-fan ventilation." The door is expected to prevent the air, despite its pressure, from escaping to the surface. Thus, the haulageway receives fresh intake air, even though the fan is a blowing, or pressure, unit, but this plan is rarely used, as doors always are likely to be left open or ajar or be broken or wrenched off their hinges, and even when closed will leak much air, especially when so near the fan that the pressure difference is at its maximum.

[Moreover, the doors have to be opened for the passage of trips or, in the case of a shaft, for the travel of the cage. Automatic opening of such doors and the use of duplicate doors is indispensable under these conditions and even then much inconvenience and loss of air results. Wherever there is a second opening, as the law requires, and it is near the fan, and the exhaust system of ventilation is provided, doors are inevitable, so the number of doors will be the same whether the exhaust or the inverted force-fan ventilation is applied. However, when doors are put on the second opening, opening and closing of these rarely may be necessary.

[Shaft doors opened by the cage get a severe mauling both in opening and closing, and they have to be opened mechanically or electrically at every downward passage of the cage. Air also leaks through the space left for the passage of the rope and the guides.

[Inverted force-fan ventilation has the following advantages, which regular exhaust-fan ventilation also affords:

[(1) That the men accustomed to leave in the direction in which the coal is hauled travel in intake air, which is the safest way in case of a mine explosion or mine fire, provided these incidents occur inby from the persons involved, for such persons will be in intake, not return, air, and can travel to safety through fresh air.

[(2) That methane and coal dust are carried into the return air or to the escaping air, if the air travels more or less directly to the surface, thus ridding the mine largely of both and greatly reducing the area over which an explosion is likely to spread. The only dust in the intake will be that swept off the mine cars or that created by travel, which grinds the coal that falls from these cars.

[Fig. 1 shows a map of a mine with a blower fan delivering behind the two doors in the haulway. The main entry has a long way to go, but three side entries (using that word as covering both headings) have all been extended to the outcrop. The air is driven into the mine through a blower fan at A. This air is prevented from escaping at the right portal

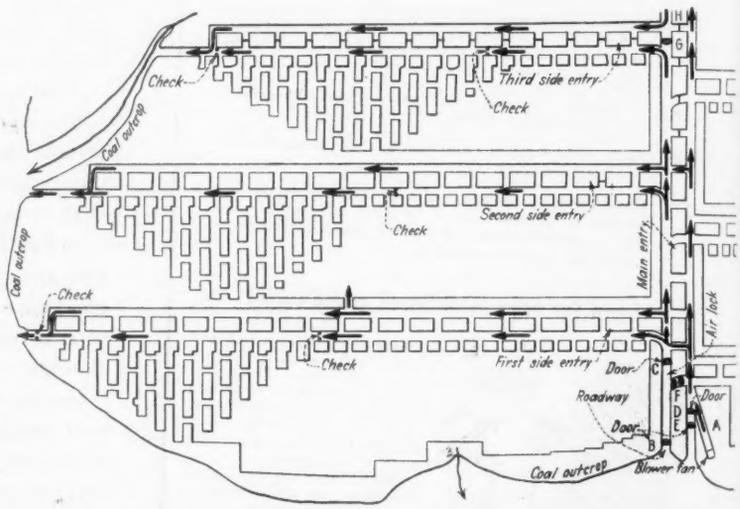


Fig. 1—A plan of development with intake air on all roadways and back headings. (Airways enlarged in plan at expense of pillars to provide space for insertion of arrows.)

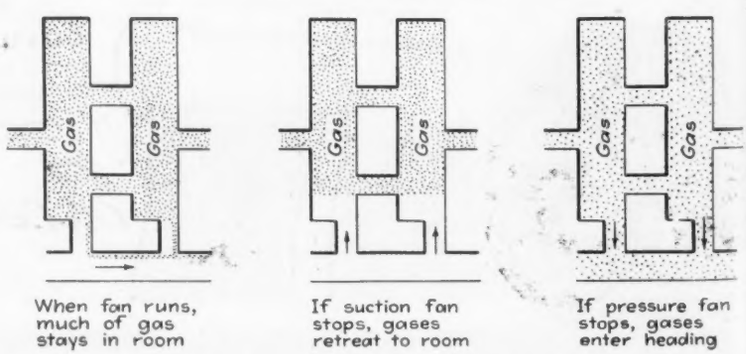
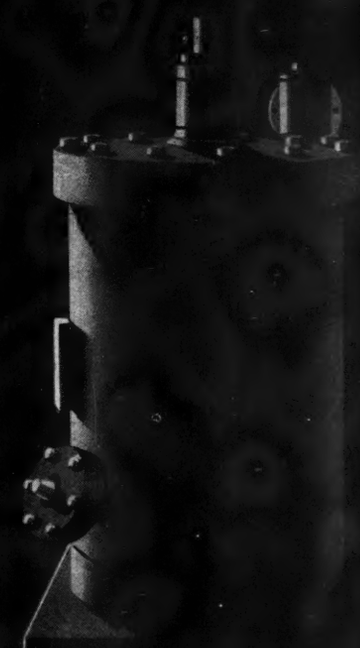


Fig. 2—Foul air escapes from goafs and rooms when force fan stops, whereas good air enters these places when an exhaust fan stops.

* Continued from July, 1943, *Coal Age*, p. 76.

d-c power problems?

investigate ignitron



SERVING WAR INDUSTRY

Today, the Ignitron Rectifier is widely accepted as the answer to many power conversion problems. More than 2,000,000 installed capacity is now serving vital war industries.

Wherever you need efficient, dependable power conversion in the 250-volt and higher range—that's a job for the Ignitron Rectifier.

Ignitron operating costs are low. Simplified automatic operation, low arc drop loss, the elimination of high starting demand and absence of major moving parts hold both operating and maintenance costs at a minimum.

Installation is easy, too. No special foundations are required. An Ignitron can be installed on any level floor of reasonable strength.

And most important of all is the uniformly high efficiency of Ignitron power conversion. It can handle constant 24-hour loads, peak loads, or light loads, all with the same relatively high efficiency.

It will pay you to investigate the advantages of Ignitron for your particular d-c power requirements. Your nearest Westinghouse office can give you full information. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

in the mining industry

In addition to its inherent advantages of high efficiency, low operating costs and high overload capacity, the Ignitron Rectifier is ideally suited to mining service.

Small, compact Ignitron Rectifier substations are frequently wheel mounted and may be easily relocated in the mine as the load center shifts. Result—short feeders and lower distribution losses.

For complete information about the Ignitron Rectifier, write Dept. 7-N for a copy of Book B-3024.

J-10244-3

Westinghouse *Electronics at Work*

IGNITRON RECTIFIERS

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

by doors *D* and *E*, which are placed far enough from the mine entrance to be in solid material, so that the air cannot escape either through them or behind their casings. These could be made stoppings, if passage through them is not desired. The roadway of the main entry is closed by doors *B* and *C*, set also in solid material and far enough in to prevent leaks and sufficiently far apart that one door always can be closed when a trip is entering or leaving the mines. Because the left side-entries go to the outcrop, it is possible to have the air in both the headings of these side-entries travel in the same direction.

[Brattices or doors (except such doors or brattices as have been specified) are unnecessary except at *F* to prevent air from entering the air lock and at G, where a door is placed to compel air to travel along the main entry beyond the third left side-entry, which extension is supposed, at present, to be only short. Stoppings are left, however, in the third side-entry crosscuts, not because they are all needed but because they will be later when the main entry is farther extended and when a difference of water gage is required to make the air travel along that extension. Whether the stoppings are in or out at this juncture is unimportant. Crosscut *H* also must be furnished with a stopping. Checks are provided in the side-headings so as to divert the ventilation through the rooms and to provide for the correct distribution of air through the left side-headings and the extension of the main entry. The amount of checking must, as usual, be determined by trial and error. The right side-entries are supposed to be worked out and abandoned.

[When air is delivered by a pressure, or force, fan it puts the air in the mine everywhere above atmospheric pressure, the pressure near the fan being atmospheric pressure plus water gage and at the discharge only a trifle above atmospheric pressure. If then the fan stops, the pressure falls and the air which has been dammed back in the goafs (collapsed workings) and in the rooms expands so that some of it passes into the heading. As this air usually contains methane and always is lacking in oxygen and has an undue proportion of carbon dioxide, it befouls the air in the heading. It does not travel far, of course, but it may interpose a barrier of unbreathable air into the heading wherever such places, especially goafs and idle rooms, are present.

[If, on the other hand, an exhaust fan is provided, the air pressure in the mine is everywhere lower than atmospheric pressure and when the fan stops, air pressure is increased, driving air from the headings into the goaf and rooms, though it has minimum effect where the air enters the mines and where, accordingly, at all times the pressure is nearest to atmospheric pressure. Yet it is just in these older goafs and rooms that the air is likely to be most foul. With an exhaust fan there is always less weight of foul air and methane than with a force fan but probably just the same percentage of impurity, for, though there is less foul air, there also is a smaller weight of air because of the lower pressure.]

Quiz Presented Applicants for Certificates As Mine Foremen in State of Alabama†

Good and Bad Fans

Q—What usually causes a fan to be termed efficient or inefficient?

A.—This query, it will be noted, is carefully worded. It does not ask "What makes a fan efficient or inefficient?" but "What usually causes a fan to be termed [or rather regarded as] efficient or inefficient?" and the correct answer is the selection of a fan that with a minimum of power will supply the required number of cubic feet of air per minute at the mine at which it is operating. Every fan is constructed to deliver, to any mine that will take it, a given volume of air at a given water gage when run at a given speed, but a modern fan can be speeded or slowed, and it will still give efficiency reasonably close to that obtained at the speed for which it was designed and when less or more air is being passed than was contemplated, which is not so true of the older types of fan. Thus the efficiency of the fan itself and the continuance of that efficiency with changes in air delivery and mine resistance is important, but there is one matter more important than fan efficiency, and that is the ability of the mine to pass air at a low water gage.

If you try to handle much more air or much less or to move it at a different water gage, due to changes in mine resistance, than the fan is designed to provide, you will not develop its maximum efficiency. Worse yet, if you propose to pull it or push more air through the mine than it will take at any given water gage, you won't succeed, no matter how excellent the fan.

Just rid your mind of thinking of a manufactured article and a manufacturer—that is, dismiss the thought of a fan and think only of a difference of pressure produced by nature, at the two ends of the air current, say by temperature or other atmospheric difference—and you will realize at once that with that difference of pressure only a certain quantity of air will be induced to pass through the mine; how much that will be will depend on its resistance.

Quantity = velocity × area of cross-section; and the velocity = $\sqrt{\frac{pa}{ks}}$ when p is pressure, a is area, s is rubbing surface and k is a constant dependent on the roughness of the mine surfaces. There is in all this nothing about a fan whether good or bad, but about a mine, the length of its passages, their resistance as mirrored in the constant chosen, the area and the pressure.

The fan only makes a difference in pressure, a water gage of so much; the mine does the rest, not the fan. A fan may be able to deliver all the air demanded of it and to provide it at the required pressure, but if the mine won't pass it through its workings when it is offered it, with such a pressure behind it, the mine will not get the air you expect it to receive, no matter what the rating of the fan. The manufacturer provides the fan, declares what it can do if given a chance; you provide the mine, and if it will take the air at that pressure, all well and good, but if not, "you are sunk." "You can lead a horse to the water, but you can't make him drink." He has to do that himself. A mine is just like that horse.

Cutting Fan Power Costs

Q—How can we obtain high fan efficiency at minimum power cost?

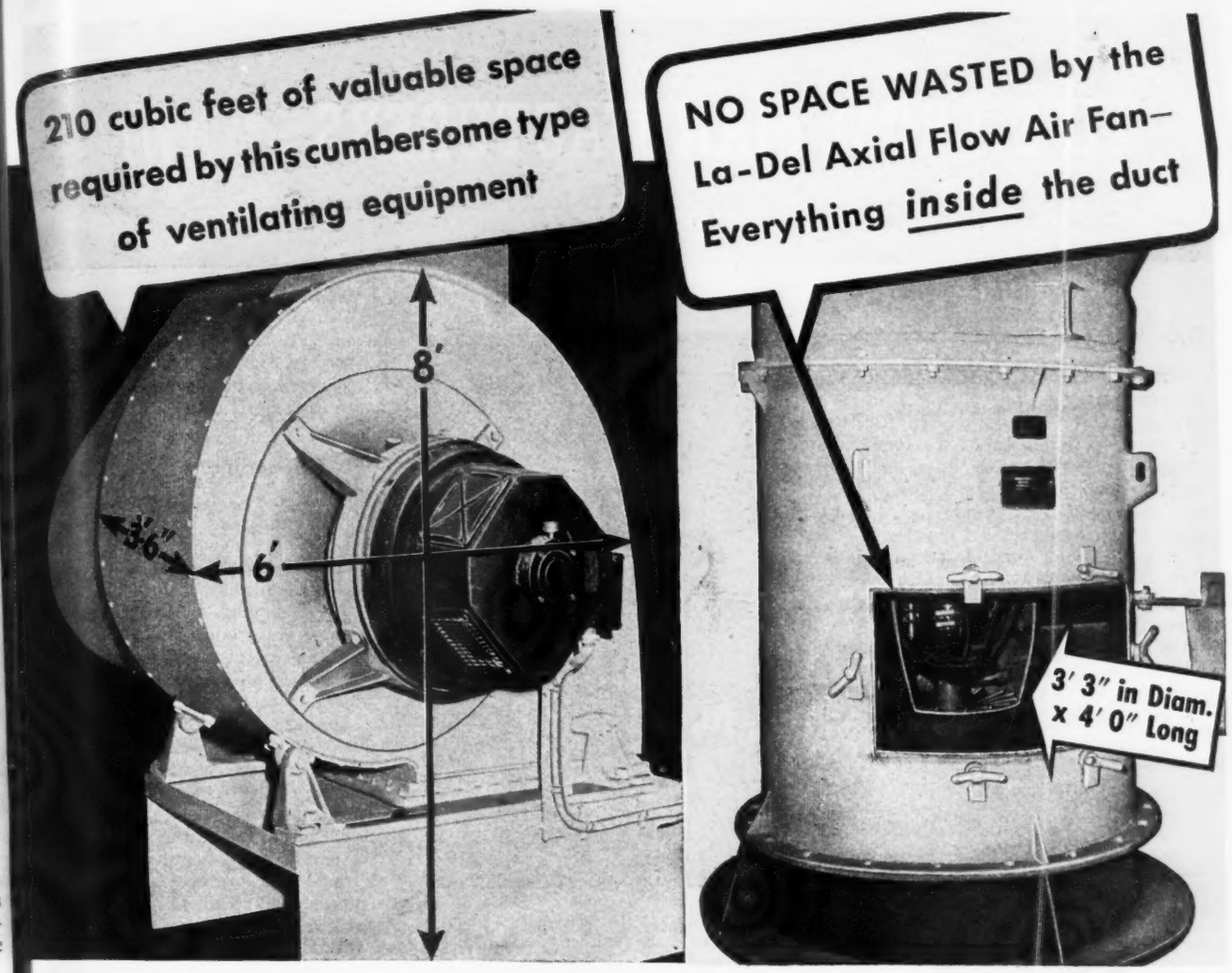
A. You can get high efficiencies at minimum power cost by purchasing an efficient fan that matches the characteristics of the mine, but you want much more than high efficiency; you want a large volume of air at low pressure and that you can get only by designing your mine to take it. The best fan imaginable will give you about 90 percent efficiency when working under the most favorable combinations of volume and water gage. If you were to get the impossible 100 percent, it would be only about 10 percent more, but you might still be a long way from getting what you really want: namely, a large volume of air at a low water gage. Reform usually "should begin at home"—in your mine—though it is true that a fan which does not fit the mine requirements will give only indifferent service, however well it will serve your neighbor where the fan just fits his mine.

A large company bought a fan as prescribed by a manufacturer and received excellent service. Another of its mines was badly ventilated and needed a new fan, so the company ordered an exact duplicate of the fan that was giving such wonderful service. The manufacturer protested that the fan would not suit the conditions at that mine, but the coal company insisted that it would accept no other than an exact duplicate. When installed the fan proved utterly unfit for the service required, and the coal company blamed the manufacturer and refused to pay for the equipment. After much correspondence, the coal company acknowledged its mistake and paid the bill. The mine simply did not fit the fan and it could not possibly give satisfaction at that location.

Remember also that a young mine is just as sure to outgrow its fan as a boy is to outgrow his clothes or shoes, and the fan of an old mine with a decreasing number of men and animals and fewer and shorter headings will just as surely be too large in capacity for the mine's workings as the clothes of an old man are too large and baggy for the shrunken frame of his declining years.

Some day, perhaps, only big companies with several mines will buy fans. The smaller companies will only lease them, and the lessor will replace the fans as they become unsuited for supplying a mine efficiently with the required quantity of air.

† Continued from June, 1943, *Coal Age*, p. 87.


210 cubic feet of valuable space required by this cumbersome type of ventilating equipment
8′
3′6″
6′
NO SPACE WASTED by the La-Del Axial Flow Air Fan— Everything inside the duct
3′ 3″ in Diam. x 4′ 0″ Long

LA-DEL Axial-Flow Fans Save Space!

THIS IS AN AGE OF STREAMLINING and space-saving, both in the design of structures and the equipment they must contain.

La-Del Axial Flow Fans are designed for the ultimate in space utilization and efficiency of operation.

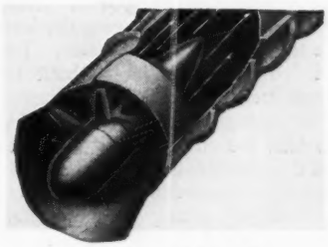
The above illustration is a typical example of how La-Del installations save valuable space. The ventilating system at the left is a big, bulky unit installed *outside* of the air duct itself. Note the large cubic feet space it requires — space which otherwise could be used to more profitable advantage.

Now note the La-Del Axial Flow Fan unit at the right. *It is entirely contained within the duct itself!* Absolutely no extra outside space is required. And it serves the air movement needs of this job with much greater efficiency.

The entire La-Del Axial Flow Fan system is as compact as a kernel in a shell. Note the diagrammatic drawing. The adjustable pitch propeller blades are designed for peak efficiency with balanced characteristics throughout adjustment and fan operating range. This blade design actually broadens the useful operating range of a fan of any given size by fully 75%. Straightening vanes, having specific relations to propeller design, correct to a true axial flow the helical air motion caused by propeller blades. The streamlined tail maintains a uniform axial flow without turbulence.

Only the La-Del Axial Flow Fan system can give you so much ventilating efficiency, in such compact space, and at such low cost.

Most of our facilities now are devoted to war work but we continue to deliver promptly all maintenance materials for La-Del underground equipment and to make reasonable deliveries on underground equipment. We recognize the vital part of coal in war.



All units within the duct, a La-Del feature

ARMY E NAVY

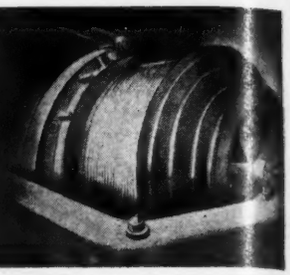
ENGINEERS OF LA-DEL AIR MOVEMENT

LA-DEL CONVEYOR & MFG. CO.

New Philadelphia, Ohio

PIONEERS IN THE DESIGN OF AXIAL-FLOW FANS FOR EFFICIENT AIR CIRCULATION

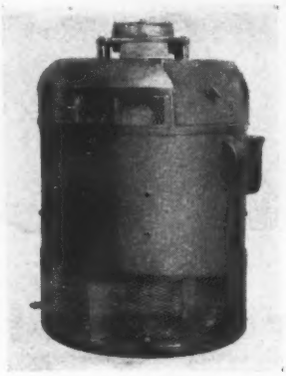
TIPS FROM MANUFACTURERS



D.C. Vertical Motors

General Electric Co., Schenectady, N. Y., offers a new line of direct-current vertical motors ranging from 40 to 200 hp. at 1,750 r.p.m. and in equivalent ratings at other speeds. Furnished for both constant and adjustable speeds, the new motors are designed for low-thrust solid-shaft applications on pumps, machine tools and marine under-deck auxiliaries. They also are said to be desirable where valuable floor space must be saved or the expense of gearing avoided.

The motors are of drip-proof protected construction, providing complete protection from dripping liquids and falling objects. Convenient fittings on both the



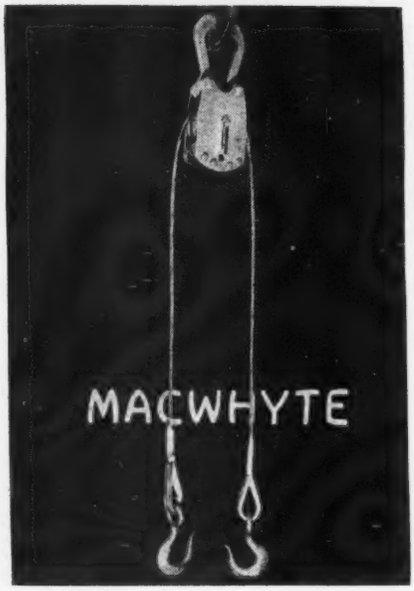
upper and lower bearings simplify lubrication and provision for escape of excessive grease reduces the possibility of overlubrication. A special bearing housing prevents grease from entering the motor and damaging the commutator and the windings.

The cast-iron conduit box is roomy and can be arranged for bringing the leads in at the top, bottom or either side. Two hand-hole covers, removable without the use of tools, permit quick and easy inspection of the commutator end brushes. The ring-type base has an accurately machined rabbet and jig-drilled mounting holes, assuring permanent alignment with the driven machine. Strong lifting lugs facilitate installation.

•

Rope Sling

The Macwhyte Caldwell "Level-Lift" sling is a new product recently announced by the Macwhyte Co., Kenosha, Wis. A single unit, says the company, handles 3 tons and a double unit 6 tons with a safety factor of five. The sling is said to embody a special patented feature which enables the rope to equalize itself and lift



unbalanced loads level. Among the advantages cited for it are simplicity, ease of use, and time and labor savings, especially in handling long pipes, boxes, steel and flasks.

•

Sheaves

Ease, speed and safety in mounting or dismounting are among the advantages of the new Pyott QD (quick detachable) sheaves for multiple V-belt drives announced by the Pyott Foundry & Machine Co., Chicago, Ill., which also offers a 12-page bulletin on the equipment. A socket wrench, it is stated, is the only tool needed for placing a QD sheave on the shaft or taking it off. The force in removing the sheave is exerted on the hub and thus, it is pointed out, removal, no matter how often it is repeated, is always easy and safe with no danger of a damaged shaft or battered motor bearings. As the hub remains permanently on the shaft, alignment is easy for the user, it is stated; also no engineering changes are involved in a change to the QD sheave.

•

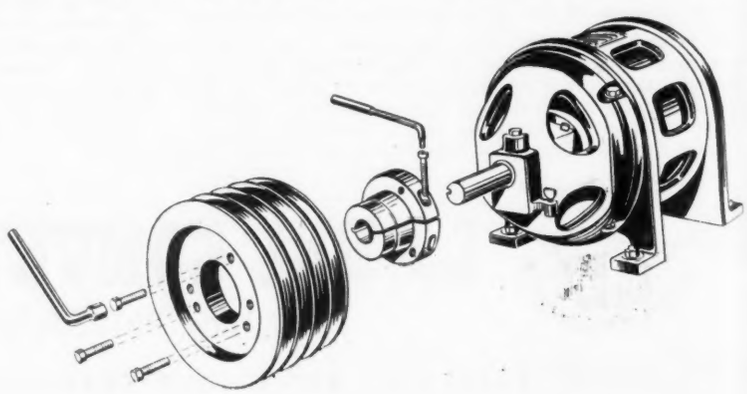
In-Plant Feeding

Hot and cold foods, packed side by side to form a complete meal, may now be served up to five hours after filling through a new system of in-plant feeding announced by Mealpack, Inc., New York City, which offers a descriptive bulletin. The Mealpack container, around which the system is built, consists of five earthenware food and beverage compartments insulated within durable attractively finished pressed steel finished in several standard covers. Each compartment is sealed with snap-in paper covers. Then the container is sealed for delivery to the worker who has ordered the meal. This "Seal-lock" is applied at the kitchen and carries the worker's number to permit ready identification when it is delivered at or near his working place. It also prevents tampering en route.

Distribution from kitchen to worker will vary with the nature and size of operation but will have every man's meal at his elbow when the whistle blows, it is stated. When unsealed, the top lid becomes a comfortable lap tray for holding the container. When the worker is finished, he orders the next meal from a menu inclosed, which simultaneously authorizes charging his account, thus eliminating any handling of cash. He then reseals the container so that it may be collected for reuse.

Advantages claimed include lower costs per worker fed, nutritious vitamin-balanced meals at lower prices, ready use of idle available kitchen equipment or caterer's services within a radius of several miles of the operation, elimination of staggering of feeding schedules and food waste, reduced absenteeism and added time for the worker to relax and enjoy his meal.

"For the duration, Mealpack containers



FRICTION *also wears out motors!*

A pair of pants is not as hard to replace as vital motor parts—but in either case, you're more interested in protection than in replacement. Macmillan RING-FREE Motor Oil *protects* pistons... rings... valves... bearings because it reduces friction faster!

Reduced fuel consumption is proof of friction Reduction!

If friction is reduced, more horsepower is released to the drive-shaft—and this extra horsepower should be measureable in reduced fuel consumption. * Compare RING-FREE with *any* other motor oil on that basis under similar conditions!

RING-FREE removes carbon

Carbon removal is a natural RING-FREE function, inherent in the crude oil and retained by the exclusive Macmillan patented process. RING-FREE removes carbon while the motor runs!

* In 1094 certified road tests, with various makes of owner-driven cars, the average *immediate* saving of gasoline was 1.3 miles per gallon after crankcases were drained and refilled with RING-FREE. In many types of Diesel operations, as much as 25% reduction in operating costs (including maintenance and fuel) are reported. At the same time, oil consumption is reported decreased!

Macmillan RING-FREE Motor Oil combines all these qualities: 1—Removes Carbon, 2—Reduces Friction *Fast*, 3—Saves Fuel, 4—Has Great Film Strength, 5—Has High Heat Resistance, 6—Long Cling to Metal, 7—Fast Penetration, 8—Is Non-Corrosive, 9—Is Less Affected by Dilution.

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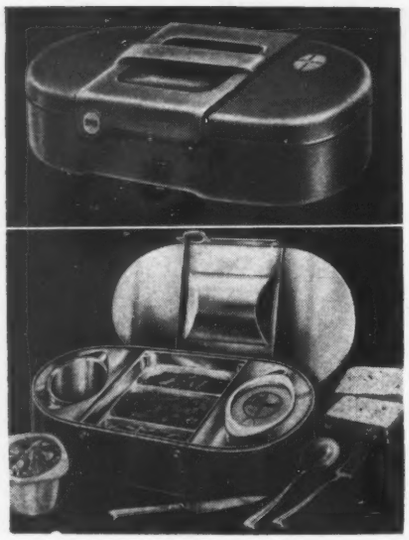
MACMILLAN RING-FREE MOTOR OIL

REDUCES WEAR BY REDUCING FRICTION



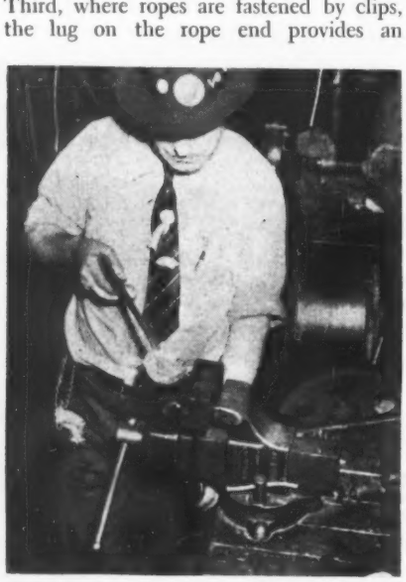
are available only for use by essential war plants, shipyards, mines, etc. (or their caterers) where new or supplementary in-plant feeding is advisable in connection with the Food Distribution Administration's nutrition-in-industry program."

•

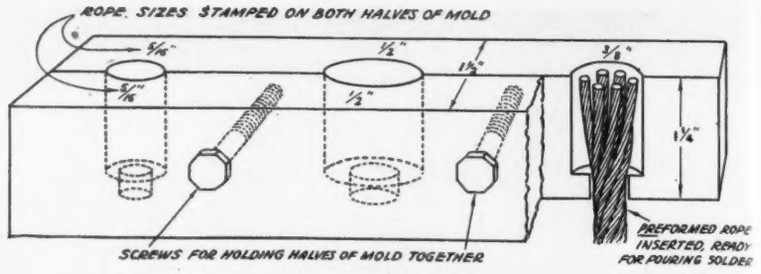
Casting Lugs on Wire-Rope Ends Has Several Advantages

"We have adopted the practice of casting a lug of solder onto the ends of many of the wire ropes used in our factory," says C. R. Hochmuth, assistant works manager, Kearney & Trecker Corp. "The only exceptions are some of the hoist ropes, which are ended in a basket-type socket, and some of our slings, in which the end of the rope is spliced into the rope body to form an eye, or bight.

"The soldered lug serves several purposes: First, it eliminates the exposed ends of the wires, which are a source of injury and infection to riggers and others handling the rope. Second, it serves as a means for readily attaching hoist ropes to the drums of overhead traveling cranes. Third, where ropes are fastened by clips, the lug on the rope end provides an additional safety feature, inasmuch as should slippage of the rope occur the last clip will catch the lug and hold the rope.



Pouring a lug on the end of a rope.



Mold for casting solder lugs.

"Because of its ease of handling, lack of tendency to fly apart, and its resistance to fatigue, preformed rope is being used throughout our plant for crane and hoist ropes and for many of our slings. Since this rope requires no seizing at the ends to hold the strands in position, it lends itself better to the casting of solder lugs on the ends. For this purpose we have made some split molds of steel, similar to the one shown in the sketch. These molds are provided for all the sizes of rope we use. The two sections of each mold are held together by means of two screws passing through one section of the mold and into the other section. The mold

Soldered lugs on a rope sling.

shown in the sketch will accommodate three sizes of rope, each size being stamped on the mold by means of punches.

"To prepare the end of the rope, the strands are unlayed for about 1 in. and the hemp center is cut back the same distance. The unlayed strands are then cleaned of lubricant and grime by dipping them into a half-and-half solution of commercial muriatic acid and water (the rope should not be inserted so deep that the acid will get on the hemp center). The strands are then tinned by dipping them into molten solder. It may be necessary to dip in acid and solder several times before a good tinning job is obtained. By bunching the strands together they are passed through the bottom of the mold and then are spread apart, after which hard solder is poured into the mold. After the solder cools, the screws holding the mold together are removed, allowing the two mold sections to be separated so the rope with the attached lug of solder can be removed.

"To eliminate sharp edges, which might cause scratches or cuts to the hands of those handling the rope, the edges of the lug are filed slightly round.

"Where solder lugs are to be applied to the ordinary, or non-preformed, rope, it is necessary to apply a seizing of soft wire to the rope at a point just below the bottom of the mold, to prevent the strands from raveling. The seizing must be applied before the strands are opened up, and it should be followed by another seizing 1 in. or so below the first. After the lug is cast, the seizings may be removed."

•

Load on Induction Motor Revealed by Short-Cut Test

In describing a short-cut test to determine if induction motors are assigned to the specific jobs where properly loaded, thus operating at higher power factor and using less current, Joseph A. Setter, writing in the March issue of the *General Electric Review*, says: "It is hoped that this method will serve as an additional tool to help in the war program of utilizing all materials to the best advantage. Proper motoring is a patriotic necessity to conserve vital materials. Overmotoring is a tacit admission of insufficient knowledge of the machine and during wartime it is almost a crime. We should err on the side of reasonable overloading to get maximum use of the motor horsepower available to produce victory."

Only a hook-on volt-ammeter is needed to make the test. As to the origin of the way in which the percentage loading is determined Mr. Setter writes that it is unknown, "but has been used with practical results by several plant electri-

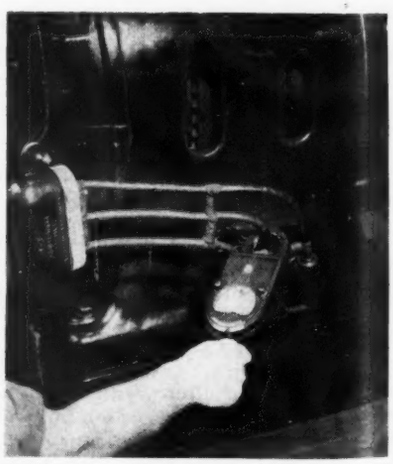
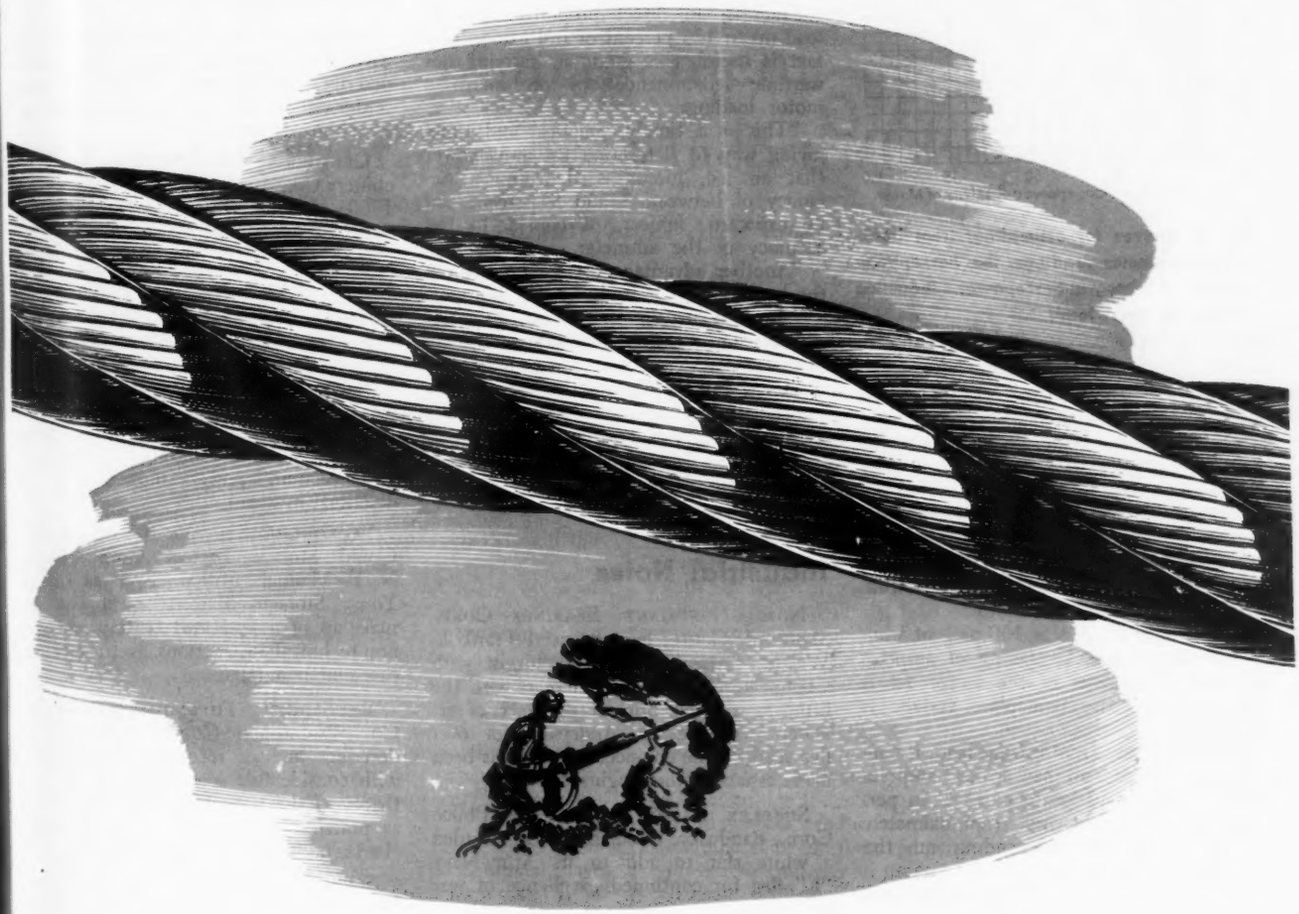


Fig. 1—Horsepower load on an induction motor being determined by hook-on volt-ammeter readings of motor current, which readings are then converted to horsepower by the short-cut method.



SPECIFICATIONS and standards cover only a few basic qualities in wire rope . . . Only time and service can certify stamina and endurance . . . the long life that ensures economy . . . the safety factors that prevent accidents and lost days of work . . . Long service in tough jobs all over the world has established the rating of Rochester . . . All our production today goes to government services and high priority industries . . . But after the war, remember that Rochester still means the best in wire ropes . . .

ARMY E NAVY
Jamaica Works

ROCHESTER *Ropes*

JAMAICA, NEW YORK • CULPEPER, VIRGINIA

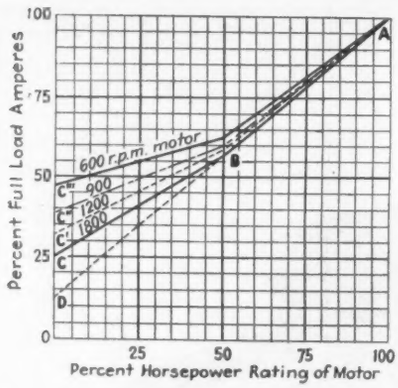


Fig. 2—Curves for estimating, from hook-on volt-ammeter readings, the horsepower output of integral-horsepower induction motors at any load.

cians for a number of years and has been checked for accuracy with design data of motors. Loss of production time is not necessary because with this method the leads to the water need not be disconnected to make the tests.

"Only the following simple steps are required:

"1. Prepare a chart form (Fig. 2) with 'percent horsepower' against 'percent full-load amperes' for each motor.

"2. Locate point *A* as 100 percent from the motor nameplate reading of amperes at rated horsepower of the motor (it is assumed that the nameplate voltage is maintained).

"3. Disconnect motor from load, if convenient to do so, and read no load amperes with ammeter and locate point *C* in percent of full-load current (approximately 25 to 45 percent, depending on the speed of the motor).

"4. Locate point *D* half way between *O* and *C* and draw line *DA*.

"5. Locate point *B* on line *DA* at 50 percent of the motor horsepower rating and draw *CB*.

"6. Then line *ABC* will be the approximate curve of the percent horsepower output of the motor plotted against percent of motor current.

"7. For any motor current, read in amperes, calculate the percentage of the full-load current, follow horizontally until the line *ABC* is intersected. Then drop vertically and read the percent load of the rated horsepower of the motor.

"If it is not convenient or feasible to disconnect the motor from the load as suggested in Step 3, the no-load current can be determined directly from the curves shown in Fig. 2. For example, an 1,800-r.p.m. motor has a no-load current of approximately 25 percent, which is the average for motors up to 100 hp. Lower-speed motors have higher no-load currents, in the order of 45 percent of full-load current for 600-r.p.m. motors.

"It may be surprising to find that the no-load currents are as high as that shown in Fig. 2, but it should be remembered that the no-load current is nearly all magnetizing current at practically zero lagging power factor and that the actual horsepower input from the power system is very low. This accounts for the rather high currents below one-half load where the efficiency of the motor also is lower.

"From one-half to full load it can be seen that the motor current is roughly proportional to horsepower output because both efficiency and power factor are higher and more nearly constant.

"Above full load, the current continues to increase in direct proportion to the load up to 125 percent of full load. This fact is useful as a guide in carrying out wartime recommendations on increased motor loadings.

"This is a timely, practical and time-saving way to determine the horsepower that an a.c. motor is delivering. Accuracy of between 3 and 5 percent can be expected, subject, of course, to the accuracy of the ammeter.

"Another advantage to be obtained by the hook-on volt-ammeter is that the voltage applied to the motor can be read simultaneously with the current. It is obvious that a motor must have the proper voltage applied or the current will be higher and overheating may result. The test also will give an indication of the loads on the feeder copper so that remedies can be applied if needed."

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Industrial Notes

NORMA-HOFFMANN BEARINGS CORP., Stamford, Conn., has advanced Frank L. Wright, formerly chief metallurgist with a connection of over eleven years with the firm, to the position of manager of research. Warren D. Anderson, for over five years on the engineering staff, has been made assistant chief engineer.

SIMPLEX RADIO DIVISION of Philco Corp., Sandusky, Ohio, has been awarded a white star to add to its Army-Navy "E" flag for continued excellence of war production.

B. F. GOODRICH CO., Akron, Ohio, has placed R. G. Cox in charge of molded goods sales, succeeding E. R. Miller, recently retired. Mr. Cox has been with the company's industrial products organization for the last 18 years.

WICKWIRE SPENCER STEEL CO., New York City, has appointed W. F. ("Bill") Sewart as assistant sales manager of the hardware products division. He has been with the company since 1923.

AMERICAN BRAKE SHOE CO., American Manganese Steel Division, has appointed Joseph L. Mullin as general superintendent of foundries. He had been works manager at the New Castle (Del.) plant, but will operate in his new position from the offices of the company at Chicago Heights, Ill. W. F. Kelly, plant superintendent at New Castle, has been named works manager at the place.

GOULD STORAGE BATTERY CORP., Depew, N. Y., has appointed C. A. Walker as sales engineer in the Birmingham (Ala.) territory with headquarters at 649 Fulton Ave., W. E., Birmingham.

FARRIS ENGINEERING CO., Ridgefield, N. J., has established a new division to handle valve repairs. Manned by skilled mechanics engaged in the actual manufacturing of valves, this division is stated to be fully equipped to recondition and reconstruct speedily all types of reducing, relief and standard or special valves and control apparatus.

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Trade Literature

CONTROL CENTERS—Trumbull Electric Mfg. Co., Plainville, Conn. New circular describes and illustrates its line of control centers, including both motor-control and switchboard types.

CRUSHERS—Austin-Western Road Machinery Co., Aurora, Ill. New bulletin (No. 1960) describes the company's complete line of roller-bearing jaw crushers.

EXCAVATORS—Buckeye Traction Ditcher Co., Findlay, Ohio. Bulletin 543 describes the Buckeye Clipper shovel, taking apart, page by page, and holding each major part up for minute inspection. The advantages of "Mevac" vacuum power control are explained and exclusive features resulting from the use of vacuum power control, such as the automatic swing brake and vacuum power dipper trip, are described in detail.

PROLONGING STORAGE BATTERY LIFE—Gould Storage Battery Corp., Depew, N. Y. Manual entitled "Facts of Life for Your Storage Battery" explains the make-up of a lead acid battery and gives non-technical instructions as to its proper care and maintenance.

RECORDING THERMOMETERS—Bristol Co., Waterbury, Conn. Bulletin T800 describes line of recording thermometers with considerable space given to the basic theory of the several types offered, as well as practical information regarding ranges, charts, bulbs and tubing available.

SCREENS—Wedge-Bar Screen Corp., New York City. Bulletin describes salient features of the Wedge-Bar screen, a profile bar screen with continuous slots, listing materials, openings and sizes.

STEEL BELT LACING—Bristol Co., Mill Supply Division, Waterbury, Conn. Bulletin 773, covering line of steel belt lacing, gives prices, sizes and descriptive information.

TIRE INFLATION—B. F. Goodrich Rubber Co., Akron, Ohio. New bulletin entitled "Airing our Views on Air Pressure" discusses proper tire inflation and what it accomplishes. The company also offers a new wall chart on "Truck and Bus Tire Loads and Inflation Table." One copy may be obtained upon request by truck or bus operators in highway service.

USE OF SOCKET WRENCHES—Blackhawk Mfg. Co., Milwaukee 1, Wis. "Meet the Mechlins," a new 12-page booklet, deals with the care and use of socket wrenches for greatest satisfaction and longest repair-free life.

WATER TREATMENT—Cochrane Corp., Philadelphia, Pa. Publication 4008, entitled "Boiler Feed-Water Conditioning and Chemistry," deals with the most common processes use in feed-water conditioning and discusses such factors as the characteristics of the hot-process water softener, zeolite softener, removal of gases, embrittlement and carry-over.

Management
—Heart of America's Industrial Progress

In Peace and War, Management Men and Methods Steer Production on a Steady Upward Course

WHEN the Allied armada of 2,000 ships, protected by a vast umbrella of planes, struck the coast of Sicily, Axis leaders once more had reason to wonder how "that decadent, pleasure-loving America" had swung from the manufacture of automobiles, refrigerators and costume jewelry to equipments of war, and had out-produced such mighty plants as the Krupp, the Fiat and the Skoda works — and had done it so quickly.

America at war is in the lead just as it has led a world at peace. Super-performing planes are taking to the air at the present rate of nearly 100,000 per year. Ships, to carry the war to our enemies, slide down the ways at the rate of two a day. Tanks, trucks, guns, ammunition are pouring out of our "peace" plants in far greater volume than the entire Axis effort can possibly equal. War expenditures in 1943 alone will reach the staggering figure of approximately $83,000,000,000 — an amount equal to our entire national income for 1929. Added to this is the rock-bottom output of essential civilian goods — a very considerable item.

This unprecedented production is taking place while some 9,000,000 men and women, those physically best equipped, have been called to the armed forces. Many of them were taken from industry, and their loss could be repaired only by more efficient equipment and more effective methods.

Rigorous training programs had to be superimposed upon many other abnormal problems facing industry in its high-speed conversion from stoves to boats; from printing machines to guns; from automobiles to airplane engines; from fishing tackle to bomb sights.

This phenomenal task was further complicated by the need for rapid expansion. A modest machine tool industry had to be expanded to handle a volume many times its normal capacity. Steel production had to be increased by 20%, and that of aluminum and magnesium multiplied over and over. From almost nil, the demand for high octane gasoline soared to unbelievable quantities. The creation of synthetic rubber and electronic industries was necessary almost overnight.

Who deserves credit for these accomplishments? All industry! The engineers, chemists, designers, skilled workers, common laborers. But over and above all it belongs to *management*.

In industry it is mandatory to have a directive force to co-ordinate the efforts of men in the use of materials and the application of power toward the production of goods and services. The application of this directive force is the function of management, and only because we had today's kind of management were we able to transform ourselves, almost overnight, from a peace-loving nation to the world's greatest producer of implements of war. As a nation, we had been preparing for a long time to play our part in world affairs. This preparation, certainly not planned for today's objectives but none the less effective, began some four decades ago.

With the advent of the twentieth century, the character of industry in the United States, and, therefore, the character of American living, began to change. Scientific management was born. Frederick W. Taylor brought into focus and showed how to use effectively those processes and procedures upon which our present-day mass production is based. He was followed by Harrington Emerson, who made the industrial world acquainted with efficiency in manufacture and the remarkable progress to be gained therefrom in the field of production, with its consequent price reductions and wider distribution of industry's products. There followed, in industry, an alert management, a capable management, a management with vision. Without it, the work of Taylor and Emerson would have gone for naught.

It is because of this early work of management — and the extraordinary developments it produced — that the country as a whole, and particularly those employed in industry, were not over-awed by the seemingly impossible job of quick conversion to all-out war production. But let us look back four decades and examine some of those preparatory accomplishments which have proven so vital to the progress and welfare of the nation.

From 1900 to 1939 (the last pre-war year), total employment of all kinds increased 52 per cent; in the manufacturing industries alone the increase was 84 per cent. *The nation became definitely industrial.*

In 1900 the average wage earner was able to spend only 20.2 per cent of his income for things other than necessities; in 1930 his buying power for non-essentials had increased to 34.8 per cent. *The average man acquired confidence in what industry could do.*

In 1900 the average work week was 56 hours; in 1930 it was 48 hours. *The burden of production was being transferred from man to machine.*

In 1939 the United States possessed 30 per cent of the world's railroads, 72 per cent of its automobiles, 49 per cent of its telephones. *The nation's production equipment had grown to formidable proportions.*

In 1939 nearly half of the families in the United States owned their own homes, 64 million individuals carried life insurance policies and 45 million had savings accounts. National income had increased 300 per cent from 1900 and during the same period the proportion of national income paid out in salaries and wages increased from 58 to 70 per cent. And in less than this period (1914–1939) the purchasing power of the wage rate increased by 60 per cent. *There had been evolved the kind of living for which men will work — and fight.*

Since 1900, factories increased their output of goods from $11,000,000,000 to $60,000,000,000 in 1939. This increase of nearly 450 per cent was accomplished while the country's population rose only 60 per cent. In this same span of years, technological developments and improvements in methods had

increased the value added by manufacture per wage earner by 200 per cent, and the horsepower per factory worker had been multiplied by 2½. *The nation's production plant was ready to assume its gigantic wartime job.*

During this period of industrial and national evolution, management itself had changed. Prior to the advent of scientific management, our goods and services were the product of several kinds of directive activities, varying from the strictly paternalistic to the ruthless. There was little conception of the responsibility that industry now broadly acknowledges – the responsibility of trusteeship in the interest of stockholders, employees and the public – specifically; in the interest of our national economy – generally. Acceptance of this stewardship is acceptance, also, of the belief that, in the long run, no industry, and no unit of industry, that does not serve society can live.

Have the actions of management caused the times to change? Or has an alert management been successful only because it has changed with the times? Certainly, the industrial concern of 1900 would not thrive under the conditions of today. Just as certainly the new things that industry has in store for a waiting postwar world will have a far-reaching effect upon the times.

Management today seldom owns the factory or the business it manages. It is hired to perform the coordinating, directive functions. It is free to change – of itself, or with the times. Management therefore exercises its power through leadership in executing ideas . . . not through ownership.

This is the fourteenth of a series of editorials appearing monthly in all McGraw-Hill publications, reaching more than one and one-half million readers. They are dedicated to the purpose of telling the part that each industry is playing in the war effort and of informing the public on the magnificent war-production accomplishments of America's industries.

Good management can be sustained only in an environment sympathetic to its aims. It has an undeniable obligation to society, because it must be a compatible part of the social structure or be rejected by that structure as a whole.

An environment sympathetic to its aims means, also, that industry, in the very serious reconstruction period ahead, will not be at full effectiveness if it is subjected to attacks by government no matter what the underlying reasons may be – over-zealous devotion to a cause, lack of understanding or just plain politics. It was to industry – to industrial management – that the government turned when our existence as a free nation was threatened; it is to industrial management that government must turn in order to win the peace.

This statement is made in the sincere conviction that what has made America strong is industry's ability to produce consistently more and more goods and services for more and more people. It is only by actually creating them that we built up our stockpiles of the necessities of life. And it is only by creating them that we can have more of those things that make life worth while. These become available to more people as industry succeeds in getting greater output of goods and services for a given input of human energy, materials and power.

And what of the physical jobs ahead? In this country alone, there will be an immense demand upon industry to supply the things people have been unable to purchase during the war. Today the nation is wearing out not only its automobiles, refrigerators, vacuum cleaners and radios, but its very houses, its roads, railroads, and airline equipment. It is saving its money while whetting its appetite. Truly, the calls the American people will make upon industry in the postwar period will be many and insistent.

This demand can be viewed in another light. Economists say there will be 56,000,000 persons seeking gainful employment after the war. The Committee for Economic Development has estimated that $140,000,000,000 worth of goods and services will be required each year for those people. Compare that with our actual output of $97,000,000,000 worth of goods and services in 1940 when gainful employment was 46,000,000.

These future jobs will be done if industry's management is not too much hampered by government management. Management in industry performs its function in the field of *doing* things. Management in government performs its function in the field of *regulating* things. The best cooperation of the two kinds of management will be necessary in the postwar period. Certainly, too much of the regulatory kind will interfere seriously with the kind that does things.

Industrial management must improve, too. If it is too selfish, if it does not recognize definitely the trusteeship inherent in its job, if it does not understand and live up to its social responsibilities, then it will be risking all for which we are fighting. The following suggestions are made to indicate the direction that management's self-improvement can take.

Evolution in management has been too slow in some respects. Management in industry has been too prone to see the advantages in technological development while being blind to its evils. Looking at industry and social progress as a whole, there can be no doubt as to the value of technological improvement. It creates jobs. It elevates the standard of living. But that economic fact is of no satisfaction to the individual who loses his job because a new machine or a new method required one less man. By and large, this is an evil that management can do something about.

Management has been too careless of its opportunities with regard to labor. On that account the pendulum of social readjustment has swung too far. Labor has been given extensive privilege without corresponding responsibility.

Industrial management has been too slow to abandon its policy of letting the buyer beware. As a result of this, industry today is over-regulated.

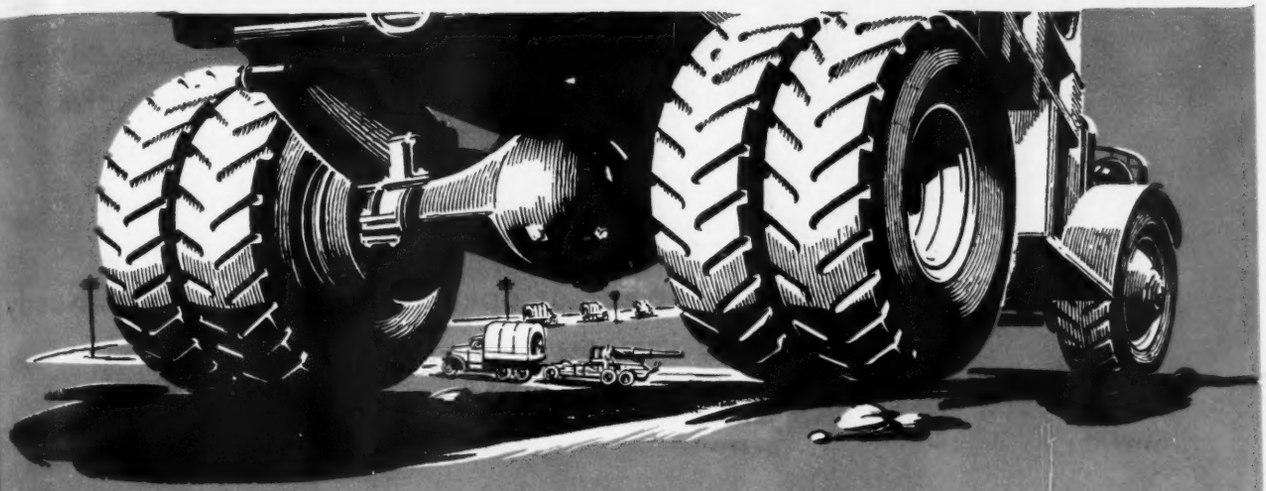
Management has been too slow in recognizing its responsibility to promote the economic philosophy that a society cannot have for consumption what it does not produce. A companion educational item too long neglected is management's obligation in the field of public relations.

In these years since 1900, industrial management has been growing. Perhaps many of its experiences have been but growing pains. Management has learned, among other things, the absolutely vital need for capital at the right time and in the right amount. It has learned to use some of its earnings as "seed money" in the introduction of new products and the use of new processes. It has learned to invest more and more in research. It has learned of the interdependence of industry and agriculture. And it has learned much about the eternal triangle of industry, labor and government.

With such a history and such experiences behind it, I have every faith that management is going ahead to even more glorious accomplishments in the winning of the war, and I believe that its peacetime accomplishments to come are beyond the prediction of any of us – even management itself.

James H. McGraw, Jr.

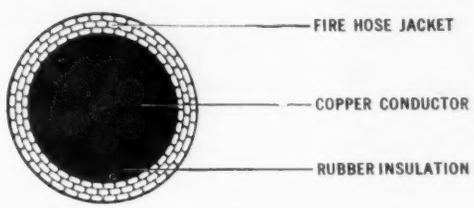
President, McGraw-Hill Publishing Company, Inc.



HOW TO SAVE RUBBER ON PORTABLE CORDS AND CABLES

Use Duracord!

Here's one way you can effectively conserve the critical rubber supply and still get long-lived heavy duty portable electrical cords and cables . . . with Duracord.



DURACORD* was developed during the last war to meet the need for super-strength cords and cables. This Anaconda construction has served in some places for more than twenty years and it is still in use today. It is *not* a new construction, adopted temporarily, because of the rubber shortage.

The Duracord cover, woven from long fiber cotton, like a fire hose, replaces the rubber jacket on all rubber cords, making possible rubber savings as high as 50%. See the cross-section above for the detail.

For further information, please write us immediately.

SUNEX SECURITYFLEX TO WAR

This well-known, all-rubber companion to Duracord has been pre-empted for the toughest kind of jobs in the war effort. Until peace, its use will be strictly regulated.

ANACONDA
from mine to consumer

This familiar trade-mark symbolizes the best efforts of modern research and production.

ANACONDA WIRE & CABLE COMPANY
Subsidiary of Anaconda Copper Mining Company
General Offices: 25 Broadway, New York City
Chicago Office: 20 North Wacker Drive
Sales Offices in Principal Cities

*Reg. U. S. Pat. Off. 42254

Sunex Securityflex and Duracord

ANACONDA WIRE & CABLE COMPANY

9. Battery is charged through the headpiece and cord — a daily test of the lamp cord and its connections. This exclusive **Wheat** feature also allows the lamp to be placed on charge and removed from charge without removing the headpiece or opening the battery cover. Ready for immediate use at all times whether on or off charge.

Check these Features!

1. Two bulbs (one for emergencies) — miner is never in the dark.
2. Center mounted, Krypton-filled bulb, gives 20% more light — no dark "shadow spot" in beam.
3. Choice of 3 reflectors gives narrow concentrated beam, a medium beam, or a widespread beam of light — suits all working conditions.
4. Headpiece weighs less than 6 ounces, Lamp Cord 6 ounces, Battery 62 ounces — Total weight of Lamp complete 74 ounces.
5. Headpiece molded of strong bakelite; sealed, moisture-proof and dust-proof.
6. Rubber battery case — non-conductor of electricity — a valuable safety feature.
7. Battery solution (free) limited to one ounce total both cells.
8. Lead-acid type battery maintains high voltage throughout shift (80+% efficiency) — year after year.
9. Battery charged through headpiece and cord of cap lamp — a daily test of all connections.
10. Designed for self-service charging system for lowest lamphouse operating cost.
11. To charge, headpiece is simply slipped on to key in charging rack, and turned to make contact. Nothing to take apart — unit-sealed construction.
12. A payment plan (purchase or rental) to meet the requirements of companies — large and small.

The Koehler Flame Safety Lamp has two outstanding features that insure protection in the mine.

FIRST—Better Ventilation.

SECOND — Greater **GAUZE AREA**, for increased sensitivity.

WHEAT

The Engineered Cap Lamp

"Wheat Mine Lamps are the only Mine Lamps 'powered' by Exide Ironclad Battery Plates made by The Electric Storage Battery Co., The World's Largest Manufacturers of Storage Batteries for every purpose."

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SPECIALISTS IN MINE LIGHTING FOR 25 YEARS

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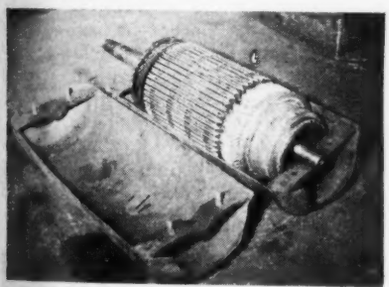
Marlboro . . . Mass.

TIMELY OPERATING IDEAS

Armatures in Steel Cases Drag Without Damage

Transporting replacement armatures to machines stalled in rooms or other trackless territories of conveyor- or scraper-operated mines has been accomplished with no little difficulty and not always without damage to armatures, especially in thin seams. And that doesn't tell the whole story—the time-honored rectangular wooden box for armature handling is cumbersome and not entirely satisfactory even in tracked workings in thick seams. Some companies have adopted stave-type tubular wooden boxes, cases or crates which are not cumbersome and at least one other company has gone further and built tubular steel cases, here illustrated.

The photographs were made in the shop of the Clearfield Bituminous Coal Corp., Clymer, Pa., which serves coal operations of the Mining Department, New York Central R. R. The first steel case was made three years ago and it proved so advantageous that a number of others have been made since. It is the plan to provide them for all armatures as soon as materials become available.



Four ⅝-in. bolts clamp the armature shaft and hold the case together. To put the armature into the "bottom" half, which is the one without bolts, lifting is unnecessary—the armature is rolled into it right from the floor.

With an armature in this crate or case one man can move it by twisting and rolling or it can be dragged endwise along the mine bottom by means of a rope and power.

Crosspieces of the two halves are made from ½x2-in. stock. Five-eighths-inch bolts have their heads welded to what is termed the top half. The cover is ⅛-in. steel with short end sections welded on. The tapered ends thus formed are an outstanding feature, as they make it possible to drag the armature along the mine bottom by a rope without its catching on irregularities and without scraping up fine material.

Four sizes of cases have been built to take care of the cutters, scraper hoists and shaker drives. Ownership of each armature case is designated by marking the mine name or number on the outside with beads deposited by arc welding. Cases remain at the mines until needed for transporting a damaged armature back to the shop.

Design of this steel armature case was worked out by John Harvey, chief electrician, and John Cox, machine-shop foreman. Maintenance men and officials now wonder how they ever got along without the cases, especially for the armatures of machines used in the working sections.

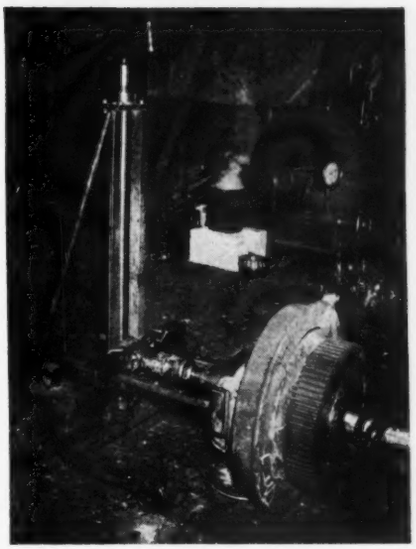
•

Portable Puller and Press Proved Valuable Tool

Special tools in some instances prove to have so many advantages that it is difficult to see how the work formerly was done without them. That is true of a portable hydraulic puller and press built and used in the Monongah (W. Va.) central shop of the Consolidation Coal Co. With it most of the jobs are now done with fewer men, in a safer manner and much quicker than before.

In the illustration, this portable tool is attached and adjusted to pull a Timken-bearing journal box from the truck of a J-2100 locomotive. The more frequent duty, however, is pulling and reassembling armature housings. By means of a screw or thread bar with a crank at the top, the hydraulic jack (20-ton size) is adjustable to any point in the range of 8 in. to 4½ ft. above the floor. The base of this jack is welded to the crosshead which includes the thread-bar nut.

For the mounting, a three-wheeled base like that on a floor crane is used. One man can adjust the jack, bars and blocks for a pulling job that formerly required two or three. Without this new portable tool pinched fingers always were a possibility. The jack had to be held up while the bars and blocks were adjusted prior to applying pressure. Exact centering is especially easy with the new outfit.



Rolled into position and the height adjusted for pulling a journal box.

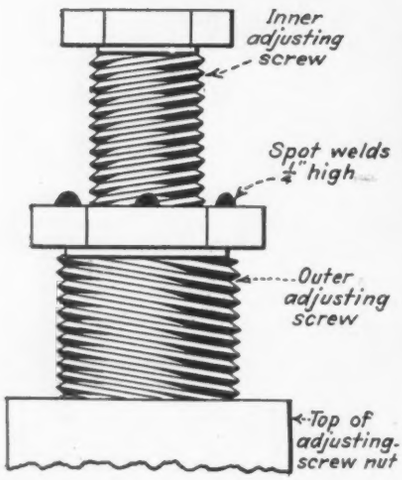
•

Locked Screws Broken Loose By Machine Operators

To help "keep the coal a-rolling" and also to save many hours of hard work for maintenance men, Peter J. Bogus, Brownsville, Pa., tells of an improvement he makes on the back adjusting screws of the elevating machanism of Jeffrey 29D arcwall cutting machines. As indicated in the accompanying drawing, three or four welds ¼ in. high are spotted on top of the outside screw. The object is to present a smaller area of contact, which is easier to break loose.

In assembling, a ⅜-in. space is left between the outside screw head and the adjusting screw nut when the inside screw is tight down against the welded spots. Then if the elevating mechanism is jammed and gets stuck, this sticking is entirely on the welds and only between the inside and outside screws. The outside screw still is free of the nut.

To break the two screws loose the back of the machine is elevated just off the rail or weight put on the back end. After throwing out the clutches of the two front adjusting screws just enough power is put on the elevating chain to jerk it a number of times. Usually the stuck adjusting screws are broken loose with the expenditure of not over three or four shear pins.



Spot welds and a different adjustment in assembly save trouble in operation.

Men operating machines with these welds added to the adjusting screws and who have been instructed in the method of "breaking" report that many times they have encountered the trouble but have saved time for themselves by breaking the screws loose. The rear screw is the one in use the most and thus is the one that gets stuck the most often. The front screws also are spotted as an aid to breaking them loose if they too should get stuck.

•

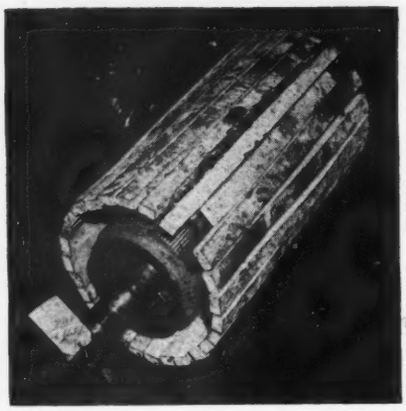
Flexible Armature Crates Better Than Boxes

After several years' experience with a flexible-type wooden crate for handling and shipping armatures, the West Virginia Division of the Consolidation Coal Co. has provided these crates for practically all armatures handled to and from the central repair shop at Monongah.

Principal among the advantages is the fact that one man can move almost any armature around on the floor and that the compactness leaves no need for taking the armature out of the crate until it is right at the machine where it is to be installed. With the old rectangular wooden boxes, which in themselves were rather heavy, it was a hard job for men to handle the larger armatures in the mines or other places where lifting facilities were not available. Consequently there was the temptation to remove the armature from the box and roll it to position.

These new circular crates consist of strips or staves of 1x1½-in. oak each with two holes. When assembled, they are held together by ½-in. 36-strand wire rope. Applied to the armature, ends of the assembly are pulled and held together by two ⅞-in. bolts through two staves. The wire rope is in one piece and the ends are anchored to each other by clamps.

Other advantages of this crate are ease of arranging a sling for crane or hoist lifting, and the light weight and small space required to store the crate when not in use. Moreover, other crates do not have to be disturbed to get out any other one. In the Monongah shop an average of 45 crates are stored by being hung from hooks that slide on a 15-ft. bar.



Mechanical protection is provided for coils and commutator, yet one man can move the armature by twisting and rolling.

No Let-up

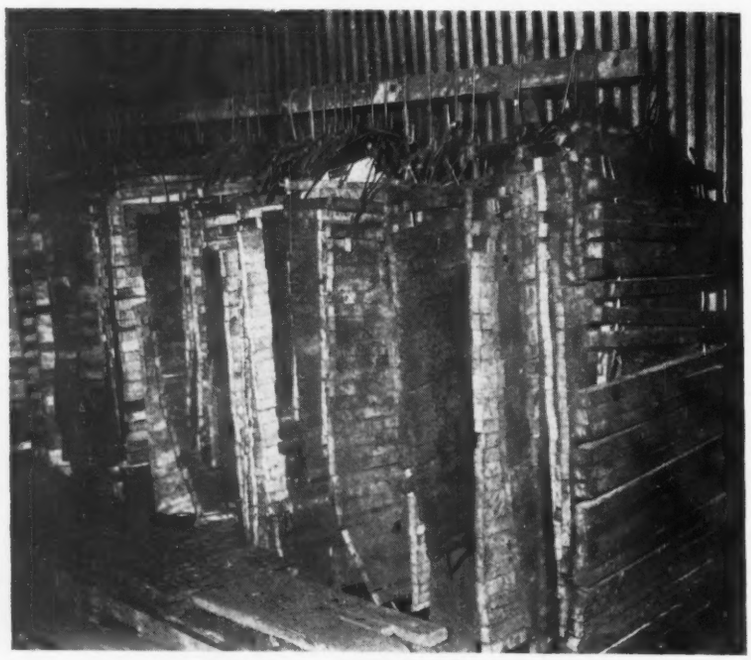
Production and more production is the keynote in coal mining today. This production must be achieved under conditions far less favorable than in peacetime. So a knowledge of the short cuts and efficient ways of keeping the coal rolling, reducing maintenance and promoting safety now is more important than ever. These pages are designed to supply such data to operating, electrical, mechanical and safety men. Do you have something that belongs here? If so, send it in, along with a sketch or photo if it will help to make it clearer. For each acceptable idea, Coal Age will pay $5 or more upon publication.

•

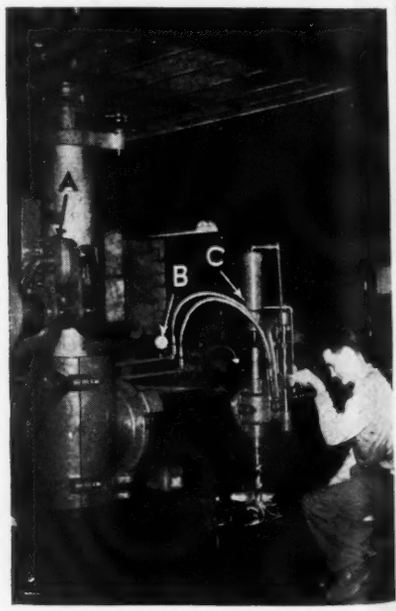
Hydraulic Feed on Shop Drill Uses Old 11 BU Pump

What can be done in the mine shop to modernize old tools is shown by the accompanying illustration of a radial drill which has been fitted with a hydraulic feed having a finger-touch control of speed and of the raising and lowering of the drill chuck. In addition a small motor has been connected to the screw to adjust the height of the arm.

The hydraulic pump, A in the illustration, was removed from a Joy 11 BU loading machine. This particular pump was worn so that it would no longer



Forty-five armature crates hung on a bar in a corner of the shop.



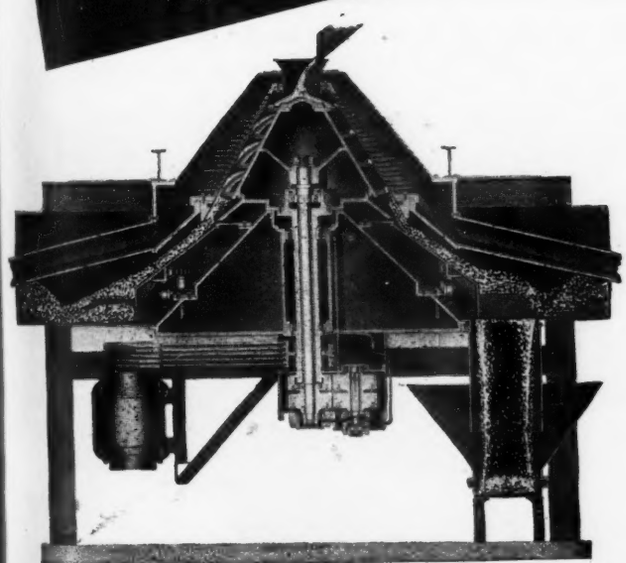
Finger-touch control of feed and pressure available when drilling a 1¼-in. hole.

MAKE Money OUT OF WASTE

Secure SALABLE COAL FROM YOUR SLUDGE OR SLURRY

- Prevents freezing of coal in transit or storage.
- No clogging of bins, cars and spouts.
- All with a low installed cost.

"C-M-I" *Continuous Centrifugal* DRYER



★ Reclaim fine coals that are now wasted—turn them, at a low cost, into a salable product—

For the "C-M-I" dryer will dewater fine coals cheaper than any other known method or machine and the dryer may be so arranged that little or none of the finest sizes are lost—or it may be so arranged that the finely divided clay and ash particles are thrown away with the effluent.

CENTRIFUGAL AND MECHANICAL INDUSTRIES, INC.

SECOND AND PRESIDENT STREETS ST. LOUIS, MO.

maintain sufficient pressure for operating the loader but it still is capable of providing the 50- to 200-lb. pressure used for feeding the drill. This pump is chain-driven from the shaft of the cone pulley and operates all the time the drill motor is going. A relief valve mounted in a by-pass near the pump has an adjustment for setting to the pressure desired and this is indicated by a gage, *B*, mounted facing the operator.

Bore of the operating cylinder is 2 7/8 in. so that a 50-lb. oil pressure is capable of forcing the drill down with a total pressure of 300 lb. One small lever operates a three-way valve which raises or lowers the drill chuck and starts and stops the feed. Another adjusts the opening of a valve in the oil line, thus controlling the speed of feeding the drill down into the work. Adjustable stops limit piston travel.

On top of the column of the radial drill is the ¾-hp. motor added to raise and lower the arm. The reductions are secured by roller chains. This motor and the main drive motor are fitted with pushbutton control.

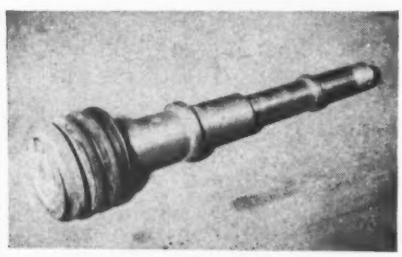
The radial drill was very old and out of date when installed in this shop. Now with the added equipment its performance is ahead of many drills built only a few years ago.

•

Worm Cut From Feed Shaft Bored Out and Re-Used

Money and materials are being saved by an unusual method of reclaiming feed shafts No. 115911 for Type 29LE mounted cutting machines in the Monongah central shop of the Consolidation Coal Co.'s Northern West Virginia Division.

Shaft failure usually consists of a torn key seat or stripped thread. A build-up by welding is not practical on this shaft and the job is out of the field of metallizing because great strength is involved. In practically all these failures the worm



The worm, which is from an old shaft, was drilled, bored, then pressed and welded onto a new shaft, made locally.

is still in good condition but in the factory-made part it is integral with the shaft.

So the old shaft is cut from the worm and the center of the former drilled and bored out. A new shaft is made and pressed into the old worm. It is secured further by a circular bead of welding at the end. A groove for this welding is formed by cutting the end of the shaft to a bevel. The reclamation cost is less than one-third the price of a new shaft.

Gravity Basket Lowers Lump In Truck-Mine Tipple

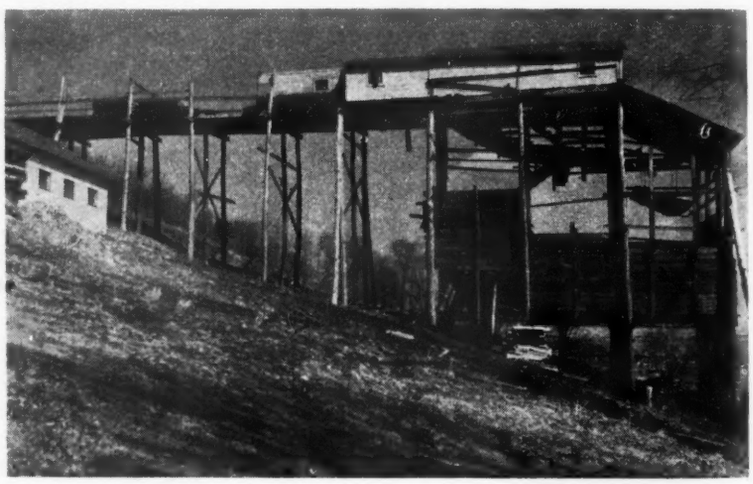
Lowering lump without breakage, a problem in tipples of the smaller truck mines, was met by use of a gravity basket at the new plant built two years ago by the Marchesi Coal Co.—John Marchesi, owner—near New Philadelphia, Ohio. This small mine has modern equipment and the power for operating the cutting machine, locomotive, pumps and a shaker screen is furnished by a diesel generator.

The operation is a drift in the No. 6 seam, there ranging from 36 to 38 in. in thickness. Built on a rather steep hillside, the tipple has ample height for a four-compartment truck-loading bin, a chute to the compartment next to the hill, a shaker screen and car-dumping hopper.

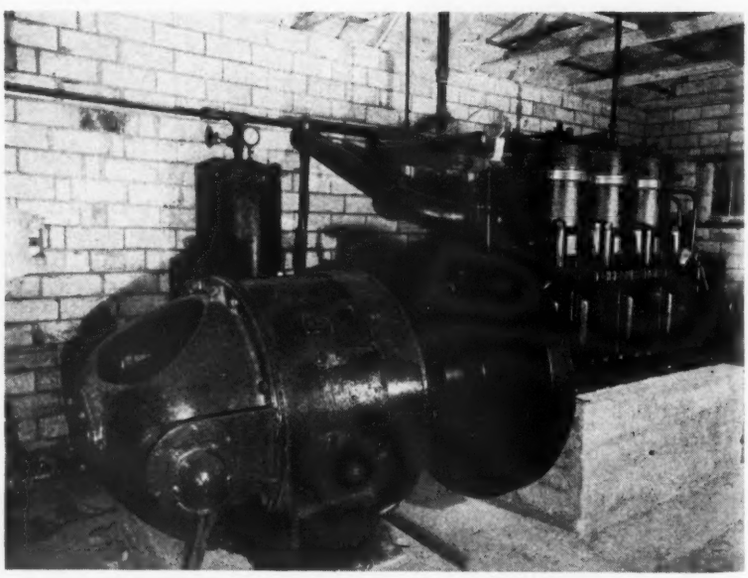
The lump basket, suspended by four wire ropes, is gravity-operated by means of two long shafts or drums geared together, a counterweight and a hand-brake. This basket dumps automatically when lowered into the bin and this dumping is brought about by other ropes which limit the travel of the outer end of the basket, thus allowing the nose to tip down so the coal will slide out gently. O. L. Fanti, mine foreman, planned the tipple-basket arrangement and the equipment was built by the Buckeye Machine Co., New Philadelphia.

Generating equipment for the power house was purchased new for the job and consists of a Fairbanks-Morse 90-hp. three-cylinder Model 42-E diesel engine having 8¾ x 10½-in. cylinders, operating at 450 r.p.m. and by direct connection driving a General Electric 60-kw. Type RA 250-volt generator, compound wound and with its armature mounted in ball bearings.

Power is furnished to the following equipment: one Jeffrey 35B shortwall cutting machine, one Jeffrey 2½-ton trolley locomotive, two 2-hp. motors driving mine pumps (one reciprocating and one centrifugal) and one 7½-hp. motor driving the tipple screen. The mine is equipped with 25 wooden cars of 1 ton capacity and the loading is by hand.

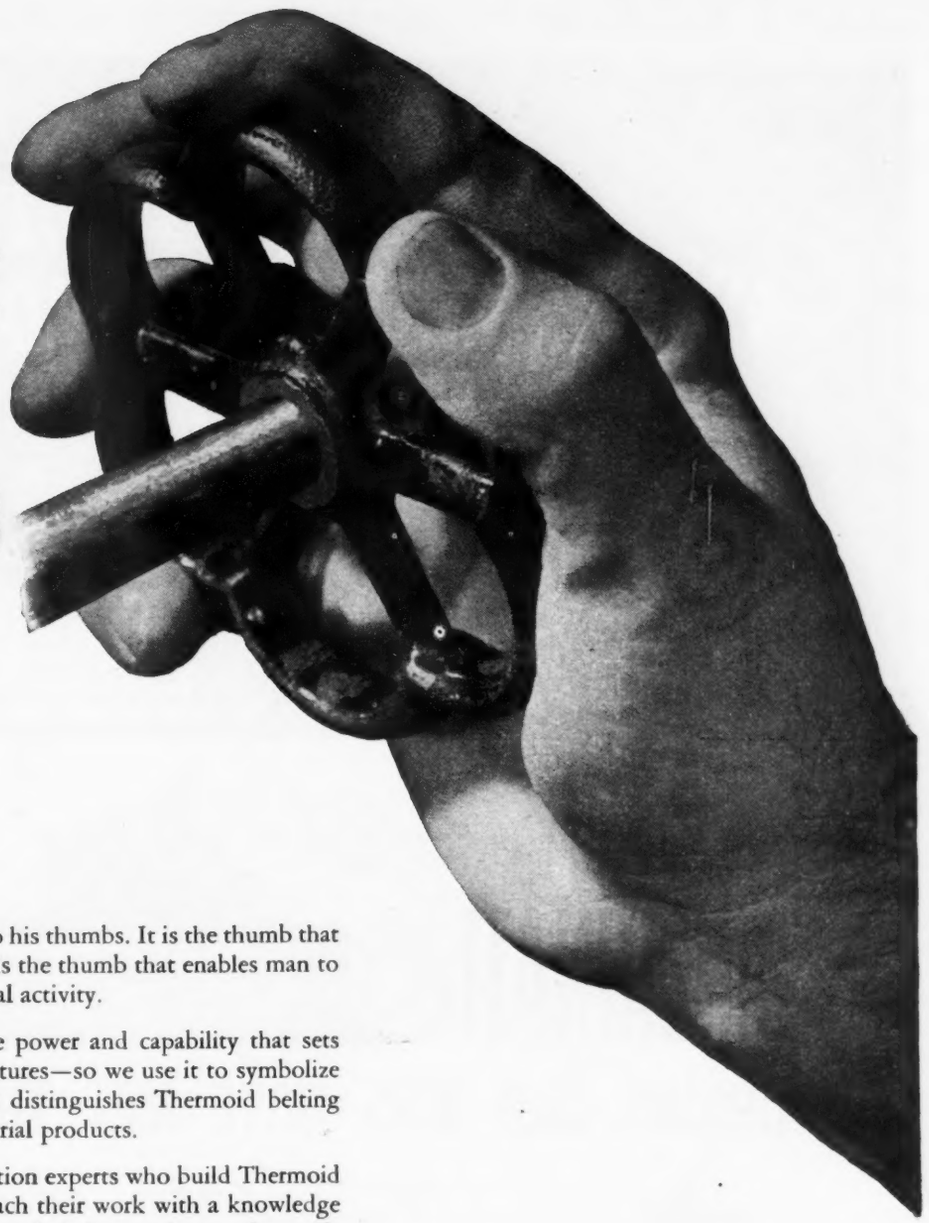


At the right a basket of lump is on its way down into the bin. Power plant building at the left.



Electric power is provided by a direct-connected diesel unit.

BELTING AND HOSE WITH A THUMB



Man owes his handiness to his thumbs. It is the thumb that gives grip to the hand. It is the thumb that enables man to master and control physical activity.

The thumb represents the power and capability that sets man apart from other creatures—so we use it to symbolize the extra something that distinguishes Thermoid belting and hose and other industrial products.

The engineers and production experts who build Thermoid Industrial Products approach their work with a knowledge of end-use problems. Beyond their equations and specifications, these men see the millions of tons of material that will be carried on a conveyor belt . . . the miles of seams to be made with a length of welding hose.

The Thermoid name on industrial products is proof positive to everyone in your organization—from the President down—that the Purchasing Agent is giving Production and Maintenance the best that can be had.

P.S. In line with material conservation, Thermoid has prepared a series of bulletins on how to extend the life of rubber products now in use. You might find them helpful to be passed on as reminders to your operating people. Feel free to ask for copies.

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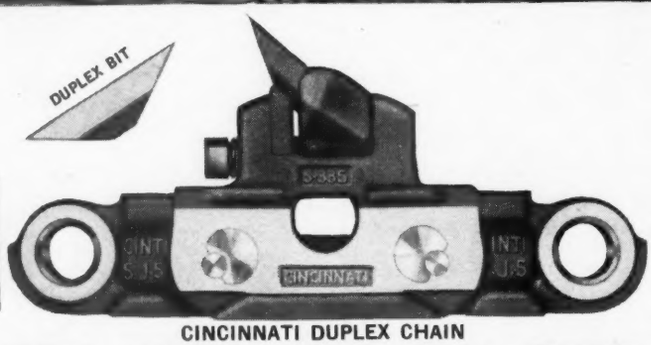
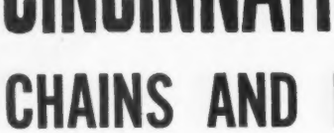
YEA! BEEN USING THEM FOR A LONG TIME... CUT FASTER...USE LESS POWER-FEWER REPAIRS

CINCINNATI



CINCINNATI DUPLEX CHAIN

CHAINS AND BITS HAVE MET THE TEST



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STANEX MOUNTING

Stanex Holder and Bit reduces Bit Setting time. Fits all standard chains accommodating ½"x1" bits.

STANEX BIT

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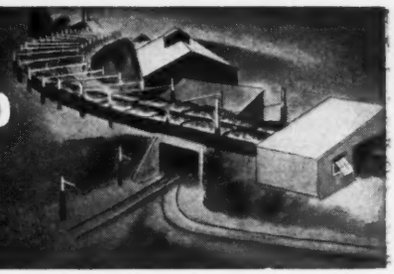
COAL AGE NEWS ROUND-UP



No Time Limit on Period of Mine Operation; Organization Being Set Up Accordingly

THE DEPARTMENT OF THE INTERIOR will continue to operate the nation's coal mines for a period of indefinite duration and is organizing its staff with that in view, Deputy Federal Coal Mines Administrator Carl E. Newton has advised *Coal Age*.

A legal, clerical and public relations staff already has been formed, and Mr. Newton said he expected Secretary Ickes would announce its personnel soon. No definite plans have yet been approved for a field organization.

Mr. Newton said the situation within the industry since the government took control of the mines in June gave the department no option except to proceed on a basis that the industry would be operated by the government for an indefinite period.

In his new job less than a month, the Chesapeake & Ohio Ry. president frankly admitted to *Coal Age* he had not yet been able to study, much less to propose a solution for, the diverse problems of the coal industry. Nevertheless, he said, he had been in almost daily conference with Forney Johnston, attorney for a group of operators, and in less frequent communication with labor leaders.

Some impression has been voiced, Mr. Newton said, that he had more powers as coal mines administrator than he actually had. "I have no jurisdiction over wages," he declared, "and no authority to make a wage agreement. My powers are strictly limited. My job is to see to it that coal is produced to fuel the war program during the period of government possession and control of the mines."

Mr. Newton repeated his statement, made originally at the American Mining Congress war conference in Cincinnati, there was nothing he would sooner do than turn the mines back to their owners. He also reiterated that both Secretary Ickes and he would resist any trend toward nationalization of the industry, and was vehement in his denunciation of operators who try to obtain loans of federal funds. He accused such operators of seeking nationalization of the mines.

He left the unquestioned impression, however, that private ownership has nothing to fear from him, that he is in fact an ardent champion of private enterprise. He realizes fully that he has undertaken a job of which the major reward probably will be paid in abuse, but he has no fear either of the job or the prospect of being a whipping boy.

Mr. Newton expressed some disappointment that his talk at Cincinnati had not received a more cordial press reception, but added he still clung to the major points he had made in it. He said in the future he would continue to tell the industry what he thought rather than what it might want to hear.

This much encouragement, however, he told *Coal Age*, could be given to the industry, and he made the statement flatly and unqualifiedly:

It is his intention to discuss every major policy move with representatives of the industry before instituting any such move.

The coal mines administrator holds forth in the office of the first assistant secretary of the department, works in his shirt sleeves and is on the job 20 hours out of 24.

Perhaps some indication of the way he is going to handle coal-mine operation may be gathered from the big office in which he works. Aside from comfortable and utilitarian office furniture, the room's sole embellishments are an electric clock and a wall motto back of his desk which reads:

"DAILY PRAYER

"Oh Lord, please help me to keep my big mouth shut until I know what I am talking about."

HOW MANAGEMENT AND OWNERS STAND

WHAT IS the role of coal-mine managements under government operation? Where do owners and stockholders stand? These queries were put to Secretary of the Interior Ickes by Coal Age in three questions. The questions and the Secretary's replies, dated July 14, are given below:

* * *

"1. What will be the role of the present mine managements under government operation; will they continue to discharge their customary management functions, such as supervision, personnel and business administration, purchasing and sales?

"Ans.: Present mine managements are expected to continue to discharge their existing responsibilities, but with all of their activities directed toward maximum production of coal for war.

"2. What will be the principal functions of the government operating organization in its relation to the mine managements?

"Ans.: To see that present managements achieve maximum production of coal for war, and to apply appropriate remedies immediately where they fail to do so.

"3. What assurance can you give to the mine managements, owners and stockholders that the normal incentives to operation and production will be preserved under the new set-up?

"Ans.: The greatest of all incentives must be to win this war. I assume this to be the normal stimulus at this perilous time. Consequently, the considerations to which you presumably refer become secondary. However, looking at the financial record of industry in general during this war, I do not think 'management, owners, and stockholders' of coal mines need suffer acute anxiety about the future if the mines turn out maximum production for war."—HAROLD L. ICKES.

Meantime, Secretary Ickes made sure of a clean sweep in seizure, announcing June 28 that he had signed orders taking over the properties and assets of some 150 additional anthracite and bituminous coal companies under the terms of the President's executive order of May 1. These companies, producing 50 tons or more per day, were among those "omitted through inadvertence" when most of the larger coal-mining properties were taken over May 1.

The fact that the Smith-Connally War Labor Disputes Act might affect the date and process of return was brought out by both President Roosevelt and Secretary Ickes. The President, on July 13, stated that the government would follow the provisions of Sec. 3, which empowers the President to exercise seizure powers with the provision that:

"Whenever any such plant, mine or facility has been or is hereafter so taken by reason of a strike, lockout, threatened strike, threatened lockout, work stoppage or other cause, such plant, mine or facility shall be returned to the owners thereof as soon as practicable but in no event more than 60 days after the restoration of the productive efficiency thereof prevailing prior to the taking of possession thereof."

The presence of the word "any" in this clause gave rise to speculation as to possible return of mines individually, and there was further speculation as to whether the government might choose to return the properties and then, if another stoppage occurred, proceed against the authors in accordance with the damages and criminal sections of the act, which, among other things, requires a 30-day notice of a strike or possible work stoppage and a strike vote.

The section on restoration also was cited July 15 by Mr. Ickes, who stated, however, that return "was not practicable now" even though production was approaching normal and 97 to 98 percent of the men had returned to work. At the same time he expressed the opinion that government mine operation was beneficial to the owners because the government was able to get miners when the owners could not, and therefore was protecting their investment.

Appointments to the government mine operating staff in July included T. J. Thomas, president, Valier Coal Co., and deputy solid fuels administrator, who was given the post of director of production in the office of mine operations; and Walter J. Tuohy, vice president, Chesapeake & Ohio Ry., named associate deputy federal coal mines administrator. Early announcement was expected of the type of organization to be set up in both Washington and the field.

The question of mines which had suffered no labor trouble or production interruptions still was unsettled at the end of July, but it was forecast that orders returning them might be issued at an early date. Otherwise, the only properties returned to that time were a few state-owned mines and the Progressive operations in Illinois.

Coal Act Permitted to Die Aug. 23, 1943; Ickes Proposes District Advisory Boards

FAILURE of the House Ways and Means Committee to report favorably on a bill for extending the Bituminous Coal Act of 1937, in conjunction with a Congressional recess, will bring the act to an end Aug. 23, 1943. New bills for a "Coal Conservation Act of 1943" have been offered in the House and Senate, however, to run for a period of two years (plus the time to the next July 1) after hostilities have been proclaimed to have ceased by the President or Congress in a concurrent resolution. Late in July Secretary Ickes asked the members of the various bituminous coal producers' boards to serve on advisory boards to help him, in his capacity as Solid Fuels Administrator for War, in effectuating the purposes of the Presidential Executive Order No. 9332, of April 19, creating SFA.

Hearings on the extension of the Act of 1937 started before the House Ways and Means Committee June 21 and came to an end July 5. As they were on, President Roosevelt wrote the committee that he hoped the act would be extended. Nevertheless, by a vote of 13 to 11, the committee rejected the extension proposal July 5, and later refused to reconsider its action.

An attempt to get action through the House Rules Committee also failed on July 6. The committee tabled a request for a rule on the McGranery resolution, which would have extended the present act to Jan. 1, 1944. No further action was taken before Congress recessed, and thus the act is permitted to die Aug. 23.

Bills for the new "Coal Conservation Act of 1943" were offered in the upper house by Senator Guffey, Pennsylvania, and in the lower house by Representative Randolph, West Virginia, on July 8, and were referred to the Committee on Interstate Commerce in the Senate and to the Ways and Means Committee in the House. These bills incorporate many of the amendments proposed to meet certain conditions growing out of the operation of the old act, including a provision for speedy interim changes in minimum prices pending final determination of changes in costs. They also provide for fixing maximum prices when deemed necessary. The 1c. per ton tax used to defray the cost of operations under the old act is omitted, however.

Proposing the setting up of a "Coal Conservation Division" in the Department of the Interior and an "Office of the Bituminous Coal Consumers' Counsel" in the executive branch of the government, the new bills have the following preambles:

"A bill for the purpose of conserving the coal resources of the nation, and for other purposes.

"Be it enacted by the Senate and the House of Representatives of the United States of America in Congress assembled, that the coal resources of the nation are threatened with waste through uneconomic practices and methods of mining, distribution and marketing of bituminous coal that also disorganize, burden and obstruct commerce in bituminous coal, with the result that study of the mining of coal and regulation of the prices of coal and of unfair methods of competition therein are necessary to conserve the bituminous coal resources, to promote commerce in bituminous coal, and to remove burdens and obstructions therefrom," etc.

Preparations for prompt action on the proposed measure were well under way in July, and indications were that its sponsors would put every pressure behind its passage when Congress reconvenes. Meanwhile, the Bituminous Coal Division made preparations for expiration of the present act. Statement No. 101 was issued by Dan H. Wheeler July 15 to govern action on remaining matters before the division. Its text is as follows:

"In view of the expiration of the Bituminous Coal Act of 1937 and the various rules and regulations promulgated thereunder at 12:01 a.m. Aug. 24, 1943, no petitions or applications filed pursuant thereto after 12:01 a.m. July 15, 1943 (including, without limitation, petitions filed pursuant to Sec. 4 II (d) of the act, applications for approval of sales agents' commissions filed pursuant to Rule 13 of Sec. II of the marketing rules and regulations and applications for registrations as 'registered distributors' filed pursuant to the rules and regulations for the registration of distributors), will be acted upon by the director.

"Similarly, if, within the opinion of the director, appropriate action cannot be concluded prior to 12:01 a.m. Aug. 24, 1943, with regard to any pending petition, application or proceeding, the petition, application or proceeding will be dismissed with such comment or statement as may be deemed advisable.

"Appropriate dispositive action will be taken by the director in all petitions, applications or proceedings not covered by the foregoing paragraphs."

Liquidation of the assets of district producers' boards was directed by the division July 26. The division also laid down rules for the safekeeping of records and data. The pertinent sections of the order (No. 357), applying to all districts but No. 21, follow:

"1. Each district board shall, as soon as practicable, and within 60 days after 12:01 a.m. Aug. 23, 1943, liquidate its assets, including all cash, tangible and intangible property, and make a pro rata equitable distribution of the proceeds thereof among the code members within the district having an interest in said proceeds.

2. Each district board shall arrange for the safekeeping of its records and data filed with it by code members so that they shall be available at the request of the Secretary of the Interior. If no other satisfactory arrangements can be made, the district board shall deliver said records

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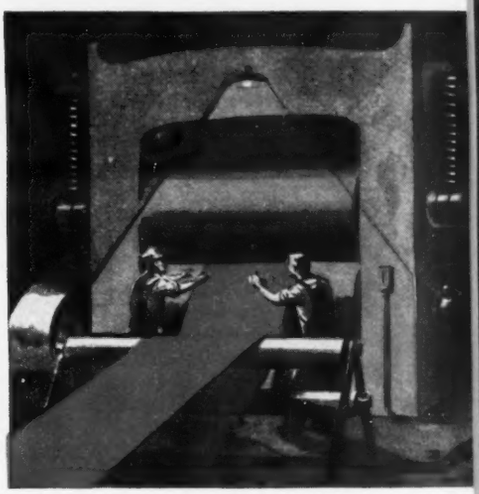
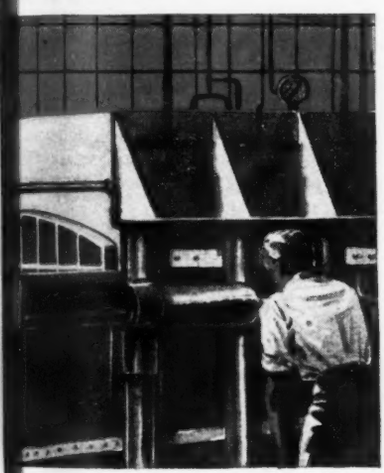


Great calendars bond FLEXLASTICS intimately to the built-in* strength members *at MANHATTAN. These may be of fabric or specially twisted cord or metal, or combinations of these.*



...izing FLEXLASTICS to give lasting ...e calls for close controls, skill and a long ...ground of experience. Different techniques ...required for different FLEXLASTICS.*

THE use of "manufactured" rubbers—commonly termed as synthetic rubber—is by no means a temporary expedient.

The special-purpose synthetic rubbers—as used in MANHATTAN Paranite-G.O.P. products—have become well established in many applications where they render superior service to natural rubber.

They are the fruit of long experience and of the same pioneering policy which made MANHATTAN the first American rubber manufacturer to initiate a continuous program of research in the industrial applications for the special-purpose synthetic rubbers then available.

To this long experience in the art of compounding and processing all available types of rubber was added the knowledge of how to make and where to place *built-in strength members*—acquired by engineering research and protracted service tests. . . . This was an additional ingredient to the 250-odd from which more than 1,000 different MANHATTAN compoundings derived increased strength, greater flexibility, cohesion and elasticity—to such a degree that it justified the coinage of a new term—FLEXLASTICS.*

The word "engineered"—long used by MANHATTAN—is well supplemented by this term "FLEXLASTICS*" so descriptive of the qualities essential in rubber products that have to deliver service under war strain.

FLEXLASTICS* is the assurance that the "engineered" characteristics are in every MANHATTAN flat or V-belt; conveyor or elevator belt; air, steam, water or other type hose; or other item regardless of the kind of rubber from which it is now made.

50 YEARS OF RESEARCH *For a business to have lived 50 years and grown continuously, is evidence of vitality and vision. The zealous preservation of that vitality and vision to be applied to production, service and research, is the obligation which management at MANHATTAN has inherited from its founders. FLEXLASTICS* are another stage in the discharge of that obligation.*

**The term FLEXLASTICS is a MANHATTAN trade mark. Only MANHATTAN can make FLEXLASTICS.*

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...EP AHEAD WITH MANHATTAN

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of RAYBESTOS-MANHATTAN, INC.
EXECUTIVE OFFICES PASSAIC, NEW JERSEY

and data to the Secretary of the Interior for safekeeping.

"3. Each district board shall file with the Bituminous Coal Division, on or before Aug. 10, 1943, a reasonably detailed report of its plans for carrying out the purposes of this order.

"4. With the expiration of the Bituminous Coal Act of 1937, as amended, at 12:01 a.m. Aug. 24, 1943 (except as provided in Sec. 13 of the Revised Statutes), the district boards shall cease to have any official status by virtue of their organization under the Act."

With the issuance of this order, Secretary Ickes moved to reconstitute the district boards into advisory groups. Telegrams were sent to the chairmen and all members of the various boards. The telegram to the chairmen follows:

"I have under consideration the matter of setting up a district advisory board for each of the bituminous coal producing districts (as described in the Bituminous Coal Act of 1937, as amended) to serve on a volunteer basis. In my opinion it would serve the interests of the bituminous coal industry and the general public if such a board, composed of men familiar with the production and distribution problems of their district, were available to furnish advice and information as it may be needed from time to time to carry out the purposes of Executive Order No. 9332 of April 19, 1943. The members of such a board would be designated by the Solid Fuels Administrator for War. The board would be permitted to obtain such voluntary contributions from the producers within the district as may be deemed advisable, provided that the budget and general plan of operation of the board were approved by the Solid Fuels Administrator for War.

"I have this day sent a telegram to each present member of your district board inviting him to become a member of the District Advisory Board of the Solid Fuels Administration for War for the district. You are hereby invited to become a member of the District Board for your district."

The telegram to board members is:

"I am considering the desirability of setting up a district advisory board for each bituminous coal-producing district and am hereby inviting you to become a member of such a board for your district. Such a board, which would serve on a volunteer basis, could perform a real service and would be great assistance to me in carrying out the purposes of Executive Order No. 9332, inasmuch as the board would be composed of men intimately familiar with production and distribution problems of the district. I shall appreciate your advice as to whether you will accept membership on such a board."

Plants for Liquid Fuel From Coal Proposed in O'Mahoney Bill

HEARINGS on the Senate bill providing for construction and operation of demonstration plants to produce synthetic liquid fuels from coal and other substances are scheduled to get under way beginning Aug. 3 and 4 in Washington. Additional sessions are scheduled in Pittsburgh, Aug. 6; Salt Lake City, Aug. 9, and Sheridan, Wyo., Aug. 11. Introduced June 18 by Senator Joseph C. O'Mahoney of Wyoming, the measure, which was referred to the Committee on Public Lands and Surveys, carries out the ideas of Secretary of the Interior Harold L. Ickes as set forth in "Coal's New Horizons," which appeared in the April, 1943, *Coal Age*.

As a specific move in the direction of initiating action to husband our diminishing petroleum resources by developing practical methods of producing gasoline, kerosene, diesel fuel, other liquid fuels and lubricants either from coal, oil shale or both, said Secretary Ickes: "I am preparing to recommend to the Congress legislation which would authorize the Secretary of the Interior to build and operate a demonstration-type industrial-scale coal-hydrogenation pilot plant or plants."

The anthracite industry, through the Anthracite Institute, sponsor of research work at the Pennsylvania State College, will be represented at the Pittsburgh hearing by a member of the staff of the School of Mineral Industries, Penn State, who will urge the installation of a suitable plant in the anthracite region of Pennsylvania. It will be suggested that water gas made directly from anthracite be used as the basis for the production of synthetics to be used in the fuel and chemical industries.

As presented, Senator O'Mahoney's measure is as follows:

"A bill authorizing the construction and operation of demonstration plants to produce synthetic liquid fuels from coal and other substances, in order to aid the prosecution of the war, to conserve and increase the oil resources of the nation, and for other purposes.

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior, acting through the Bureau of Mines, within the limits of critical materials available, is authorized to construct, maintain, and operate one or more demonstration plants to produce synthetic liquid fuels from coal and other substances with all facilities and accessories for the manufacture, purification, storage, and distribution of the products.

"Sec. 2. In order to carry out the purpose of this Act, the Secretary of the Interior is authorized—

"(a) To conduct laboratory research and development work necessary to determine the best demonstration plant designs and conditions of operation;

"(b) To acquire, by purchase, lease for a term of years or less, donation, or otherwise, land and any interest in land, including easements and leasehold interests; options on real or personal property; plants and their facilities; secret processes, technical data, inventions, patent applications, patents, irrevocable non-exclusive licenses, and other rights and licenses under patents granted by this or any other nation; to assume the obligation to pay rentals in advance on property so acquired, and to pay damages arising out of the use of any such property;

"(c) To engage, by contract or otherwise, engineers, architects, and any private industrial organization he deems suitable, to do all or any part of the work of designing, constructing, or operating the plants, the operation to be under his supervision, and through leases or otherwise as he believes advisable;

"(d) To cooperate with any other federal or State department, agency, or instrumentality, and with any private person, firm, or corporation, in effectuating the purposes of this Act.

"Sections 321 and 322 of the Act of June 30, 1932 (47 Stat. 412), as amended, shall not apply to any leases under this section; and such leases may be made for a term of years notwithstanding Revised Statutes, Sec. 3679, as amended, or any other provision of law.

"Sec. 3. The Secretary of the Interior is authorized to sell the products of the plants at not more than actual cost, including amortization of capital expenses, as determined by him, to any department, agency, or instrumentality of the federal or any State government, but priority shall be given to orders placed by the War or Navy departments. Any remaining products may be sold at going prices to any purchaser. The Secretary of the Interior, in his discretion, shall also have authority to dispose of any lands or other real or personal property acquired, but in his opinion no longer useful, for the purposes of this Act, and to grant, on such terms as he may consider appropriate, licenses under patent rights acquired under this Act.

"Sec. 4. All moneys received under this Act for products of the plants and royalties shall be paid into the Treasury as miscellaneous receipts. The Secretary of the Interior shall render to Congress on or before the first day of January of each year a report of all operations under this Act.

"Sec. 5. The Secretary of the Interior may issue rules and regulations to effectuate the purposes of this Act. The authority and duties of the Secretary of the Interior under this Act shall be exercised through the Bureau of Mines of the Department of the Interior."

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Indiana Coal Trade Group Names Lydick Director

Chester C. Lydick has been named director by the Coal Trade Association of Indiana, the post held for many years by the late Jonas Waffle, who died last winter. Mr. Lydick, an attorney, was secretary of the Association of Commerce in Moline, Ill., from 1927 until recently. R. C. Freytag, who has been serving as acting director and who was assistant to Mr. Waffle, will continue to assist the director.

Hugh B. Lee, vice president and general manager, Maumee Collieries Co., is pres-

Sanford-Day Mine Car Wheel uses TIMKEN BEARINGS

Here is a typical example of a new mine car wheel designed around standard Timken Tapered Roller Bearings. It is a demonstration of the adaptability of Timken Bearings — not only to mine car wheels, but also to individual designs in any type of equipment.

Timken Bearings are obtainable in all makes of mine cars through the use of standardized Timken Bearing wheel applications. Upwards of 350,000 mine cars have gone into operation on Timken Roller Bearings during the last 24 years. More and more continually are going into service.

Make sure your new mine cars are Timken Bearing Equipped for maximum availability, reduced operating costs and low maintenance expense. The Timken Roller Bearing Company, Canton, Ohio.

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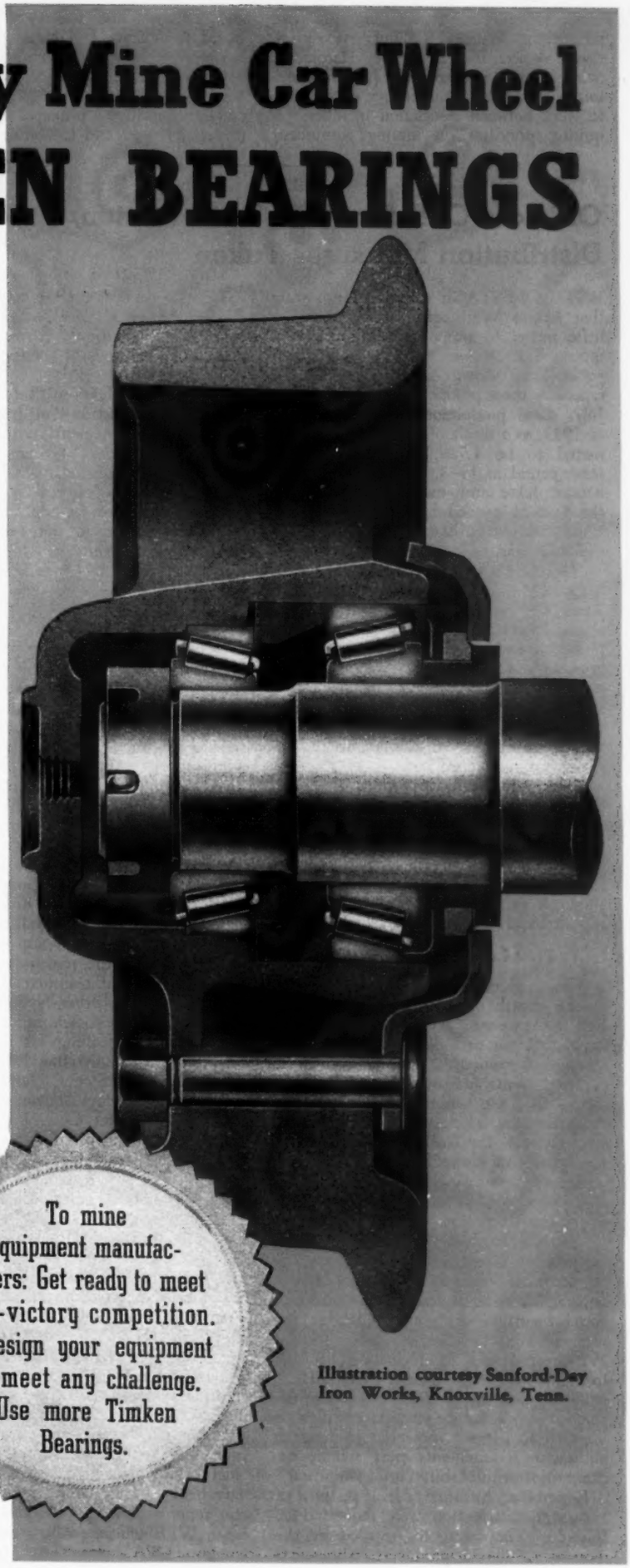
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



To mine equipment manufacturers: Get ready to meet post-victory competition. Redesign your equipment to meet any challenge. Use more Timken Bearings.

Illustration courtesy Sanford-Day Iron Works, Knoxville, Tenn.

ident of the association, and the vice president is William B. Cooke, vice president, Walter Bledsoe & Co. Harold V. Scott is traffic manager and J. A. Thompson is statistician. Emergency coordinator to work between association members requiring priorities on mining equipment and materials and the War Production Board is William J. Tipton. Mr. Tipton has been engaged in the same type of work with the smaller mines of Indiana since Sept. 1, 1942.

The association's principal activities are in legal, freight and legislative matters.

Officials Call for Fuel Conservation; Distribution Measures Taken

WITH OFFSTAGE rumblings indicating that certain Washington agencies were a little nearer to proposing coal rationing, increased stress was laid on coal conservation and distribution to consumers, especially those producing war materials, in July. Coal production for the first half of 1943, as a result of stoppages, was estimated to be 1,729,00 tons under the same period in 1943, Solid Fuels Administrator Ickes announced July 3; this in the face of a need for 25,000,000 additional tons of anthracite and bituminous coal this year.

"We face a difficult job in making up this loss during the last half of the year, when we can expect to encounter increased handicaps to production, transportation and distribution resulting from growing war activities. But we still have a fighting chance to make adequate coal available to meet our war requirements if everybody concerned, from the miner to the consumer, fully discharges his responsibility from here on out.

"The miners must produce the coal; the railroads, waterways and truckers haul it; and the dealers distribute it. Consumers who have not yet done so must cooperate by ordering their coal now and allowing dealers the widest possible latitude as to the kind, quality and size supplied and as to delivery schedules."

Plans Long-Time Distribution

The production rate continued to rise as the month of July wore on, but this did not prevent taking steps for emergency and long-time distribution of anthracite and bituminous. "Another step toward assuring equitable distribution of anthracite coal" was announced July 8 by Administrator Ickes, who stated that he had ordered the anthracite industry to report to him immediately where and to whom the approximately 58,000,000 tons of "commercial" anthracite was distributed in the last burning season.

"On the basis of these reports, it will be possible to estimate fairly closely the requirements of each community in the anthracite-consuming area and to take into account wartime shifts in population, conversions from fuel oil and other factors. We must have this information available to complete the permanent hard-coal distribution program that is now being developed. A carefully integrated plan is required to prevent inequities in meeting anthracite requirements next winter because of wartime shifts in distribution."

Reports in this first detailed study of anthracite distribution were requested by July 26. They were to be filed by the industry's 300-odd producers, wholesalers and dock operators for the coal year April 1, 1942–March 31, 1943, and are designed to show distribution by sizes, types of consumers, methods of transportation and destination.

Administrator Ickes instituted a temporary anthracite distribution program June 22 until a permanent system can be developed. Under it, producers and wholesalers are directed to distribute their available supplies of coal so that each community receives by Sept. 1 egg, stove, chestnut and pea in not less than 100 percent of the tonnages shipped during April 1–Aug. 31, 1942, or five-twelfths of the tonnages shipped to such destinations during the period April 1, 1942–March 31, 1943.

In an effort to relieve the growing paralysis of the steel industry due to mine stoppages, Administrator Ickes twice exercised his wartime distribution powers in July to divert coal from other users to steel operations. He first issued orders requiring 13 Appalachian producers to divert 22,500 tons daily to plants of the Republic, Weirton and Jones & Laughlin steel companies and the Carnegie-Illinois and United States steel corporations. These emergency shipments were to be continued for six days, beginning July 12. More than 80 percent was diverted, it was stated, from byproduct and metallurgical plants with sufficient stocks to continue temporarily and the remainder from general industrial and commercial consumers able to substitute other types.

A second diversionary order was made public July 21, calling for 10,800 tons daily for five days starting July 20 to the Jones & Laughlin Steel Co. and 1,500 tons daily for three days starting July 19 to the Weirton Steel Co. Producers and selling agencies involved were: Norfolk & Chesapeake Coal Co., Koppers Coal Division, Barrows & Co., A. T. Massey & Co., American Eagle Coal Co., American Rolling Mill Co., Wheeling Steel Corp., Clinchfield Fuel Co., Boone County Coal Corp., Walter Bledsoe & Co., Hickman Williams & Co., Black Star Coal Co., Peabody Coal Co., Rich Vein Coal Co., Valley Camp Coal Co. and Carbon Fuel Co. Both orders were issued under SFA Regulation No. 1.

Despite the Solid Fuel Administration's continued opposition to any general rationing of coal, reports that plans were under consideration became more persistent in July. OPA officials, including Joel Dean, chief of fuel rationing, were reported to have held informal conferences with operator representatives in the early weeks of July. WPB officials, who would have to sanction OPA action after consultation with SFA, also were reported to have been conferring. Tentative plans for establishing priority ratings for consumers were reported to have been passed around, although none was made public, even as a trial balloon.

Possibly as a means of postponing the day, Mr. Ickes, Joseph B. Eastman, Defense Transportation Director; and Donald M. Nelson, chairman of WPB, asked, July 22, the cooperation of industry in a nation-wide conservation campaign to release critical resources—fuel, manpower, equipment and materials—for war purposes. The coal, petroleum, electric, natural and manufactured gas, water supply, communications and transportation industries were requested to formulate plans for an intensive voluntary program to get under way late this summer and to be directed toward household, commercial and industrial users. An inter-agency government committee was set up to guide the work. Members are: J. A. Krug, director, office of war utilities; Ralph K. Davies, deputy petroleum administrator; H. A. Gray, deputy solid fuels administrator; and Mr. Eastman, with their assistants.

In the joint statement, Messrs. Ickes, Eastman and Nelson said:

"Conservation of fuel, manpower, equipment and materials is a 'must' for the United States if we are to achieve the maximum war production every American wants.

Strength in Saving

"Every pound of coal, every gallon of oil, every cubic foot of gas that can be saved means that our national energy pool is strengthened just that much. Every man-hour saved in the production of these basic fuels, in the production of electricity, in transportation and in communications is a man-hour that can be used for something else. Every pound of tungsten that is saved in the production of electric lamps is a pound that can be used in the production of radar equipment.

"These savings and the countless others that will result from a broad conservation campaign may appear small in the average household or the average industrial or commercial plant. Multiplied by millions of homes and thousands of factories and stores, however, they are tremendous. The saving of a single ton of coal next winter by one householder will not win the war. But if 18,000,000 householders do it, their combined effort will go a long way toward winning the war. That same thing applies with equal or even greater force to each of the other industries represented.

"We have, therefore, called upon the coal, petroleum, electric, natural and manufactured gas, water, communications and transportation industries to join with us in a broad conservation campaign to accomplish these results. The campaign will be voluntary. Cooperation of these industries in asking the public to use their services only as absolutely necessary represents a real sacrifice by them. We ask the American public to appreciate that sacrifice and to give them and the war effort enthusiastic and unstinting cooperation as this campaign develops."

In Stride with the Times

☆ How to make better wire rope . . . How to keep abreast of new developments in wire rope using equipment . . . How to care for and use wire rope properly so that it will last longer—these are problems that have constantly had our consideration ever since the first Leschen Wire Rope was made.

☆ Because of this background, "HERCULES" (Red-Strand) Wire Rope is daily proving its exceptional ability to cope with present wartime conditions. Its endurance and dependability mean more work hours from every pound of steel used in its making . . . less time lost in making replacements . . . greater overall efficiency.

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Illinois Operators Sign With U.M.W.: Others Press for Action on WLB Order

WHILE Appalachian operators continued their efforts to have the government enforce the War Labor Board's order of June 18, Illinois producers signed an agreement with the United Mine Workers granting portal-to-portal pay in July. At the end of the month this agreement was in the hands of WLB for approval and John L. Lewis had agreed to appear in its support at hearings. Meantime, President Roosevelt, while still refusing to accept the Oct. 31 deadline set by Lewis in ending the latest stoppage, also indicated that he knew of no way to get the union to accede to the WLB order and sign an agreement. As recalcitrant miners returned to work, productive capacity gradually got back to nearly normal, while the wildcat walkouts in western Pennsylvania resulted in the indictment of 30 men late in the month under the provisions of the Smith-Connally War Labor Disputes Act. Meantime, WLB approved a new agreement covering the Progressive mines in Illinois.

The proposed Illinois wage agreement was signed July 20 by the Illinois Coal Operators' Association and District 12. It covers the two-year period April 1, 1943–March 31, 1945, with the provision that it is not to go into effect until it has been approved by WLB and the necessary increases in maximum prices have been granted by OPA. Present wage rates are retained without change, but the contract provides for increasing hours of work from seven to eight per day, the eighth hour to be paid for at time and one-half, resulting in an increase of approximately $1.50 in daily earnings.

Portal-to-Portal Pay, $1.25

Payment for portal-to-portal travel, both past and future, was settled on the basis of $1.25 per day. The value of vacation payments and lamp, tool and other charges remitted was figured at approximately 25c. per day, making the total increase in daily earnings approximately $3, of which $1 is credited to straight wage payments and the other $2 to portal-to-portal, overtime, remission of charges and increase in vacation payments.

In fixing the portal-to-portal pay rate, the Illinois operators accepted the contention that their liability extended back to Oct. 22, 1938, when the Fair Labor Standards Act went into effect, and agreed to settlement on a "50-percent basis of 38¼c. per day." The 38¼c. was arrived at on the basis of a U. S. Department of Labor study made in 1933, showing an underground travel time of 54 minutes. At $1 per hour, the rate then figured out at 90c. It was then agreed that 85 percent of all employees worked underground, and therefore "85 percent of the 90c., or 76½c.," was agreed upon "as being a fair adjustment."

"The Fair Labor Standards Act became effective in October, 1938," said D. W. Buchanan in presenting an explanatory statement for the Illinois association. "Therefore, to April 1, 1943, there were approximately 4½ years involved in possible compensation claims. We agreed that if the entire time from October, 1938, to April 1, 1945, being approximately 6½ years, were considered, an average of 200 days per year for the entire period would not be far out of line. Prior to World War II, workdays were less. Since the war started, they have been and will be more, but 200 days seemed a fair average for the entire country. Four and one-half years at 200 days per year equaled 900 days and at 76½c. per day equaled $688.50 as being a possible liability per employee accruing prior to April 1, 1943, without taking into account the questions of overtime, double liability, interest, attorneys' fees and the other costs of litigation in a multiplicity of suits.

"If this matter were taken into the courts and the miners won their lawsuit this total amount would be due. If the operators won, nothing might be due. After both sides had given careful consideration to this entire situation an offer was made to settle this liability on a 50-percent basis of 38¼c. per day. We then figured the time from Oct. 1, 1938, to April 1, 1945, as being 1,300 work days at 200 days per year, and 1,300 work days at 38¼c. per day equaled $497.25, which, divided by the 400 work days from April 1, 1943, to April 1, 1945, equaled $1.2431 per day. Thus, we arrived at the figure of $1.25 per day settlement as set forth in the contract as submitted.

"This compromise settlement was made on the distinct and express understanding and agreement that if this settlement is approved by the appropriate governmental agencies and made effective it shall not constitute commitment by or prejudice against any party to the settlement as to rights arising after March 31, 1945, and that if this compromise settlement is not so approved and made effective it shall not constitute commitment by or prejudice against any of the parties to the settlement on the subject of portal-to-portal."

On the sixth day of the week, the proposed agreement provides for time and one-half and rate and one-half for all hours worked. However, if a miner has voluntarily laid off on a previous weekday, the proposed agreement includes a proviso that overtime need not be paid on Saturday. In addition to eighth-hour time and one-half the existing tonnage, yardage and deadwork rates are those now existing for seven-eighths of the tonnage, yardage and deadwork for each day plus rate and one-half for the remaining one-eighth. Based on the seven-hour day, able-bodied trappers, flaggers, switchthrowers and slate pickers are to be paid not less than $6, with able-bodied greasers not less than $6.75. The vacation payment was increased to $50 and the period eliminated in 1943.

30 Days' Notice to Reopen

Tools are to be furnished in accordance with the WLB directive, with a definite amount set for the purchase of tonnage workers' tools. The agreement included a "most-favored-nations" clause, as well as a proviso "that for the duration of this supplemental agreement no strikes shall be either called or maintained hereunder." Provision also is made for reopening the contract on general wage rates upon 30 days' notice after the end of the first contract year.

The Illinois contract was accepted as the ruling agreement for all bituminous fields by the United Mine Workers' policy committee meeting in Washington July 22. The committee authorized other districts to negotiate agreements carrying similar terms.

Some operators in other fields were reported to be interested in negotiating on the Illinois terms, but the major part of the Appalachian operators apparently stood fast on the WLB decision of June 18. On July 22, R. L. Ireland Jr., spokesman for the northern group, and Senator Edward P. Burke, spokesman for the southern operators, addressed a strongly worded communication to WLB Chairman Davis asking the following questions:

Keeping Step With Coal Demand

Bituminous Coal Stocks

	Thousands Net Tons June 1 1943	—P.C. Change— From May 1 1943	From June 1 1942
Electric power utilities..	20,009	+1.6	+26.2
Byproduct coke ovens..	9,219	−5.3	+ 0.4
Steel and rolling mills..	1,106	−4.7	+ 0.7
Railroads (Class 1)....	13,456	+2.1	+17.2
Other industrials*.....	28,675	+1.8	+24.6
Total.....	72,465	+0.7	+19.5

Bituminous Coal Consumption

	Thousands Net Tons May 1943	—P.C. Change— From April 1943	From May 1942
Electric power utilities.	5,500	+0.1	+ 7.7
Byproduct coke ovens..	7,666	+2.3	+ 2.8
Steel and rolling mills..	891	−4.9	+ 8.8
Railroads (Class 1)....	10,754	−0.1	+14.4
Other industrials*.....	12,656	−8.9	+ 7.8
Total.....	37,467	−2.9	+ 8.6

* Includes beehive ovens, coal-gas retorts and cement mills.

Coal Production

Bituminous

Month of June, 1943, net tons....	34,650,000
P.c. change from June, 1942.....	−28.1
January-June, 1943, net tons.....	284,894,000
P.c. change from Jan.-June, 1942..	− 0.2

Anthracite

Month of June, 1943, net tons....	3,203,000
P.c. change from June, 1942.....	−38.8
January-June, 1943, net tons.....	29,323,000
P.c. change from Jan.-June, 1942..	− 0.6

Sales of Domestic Stokers Vs. Oil Burners

	Coal Stokers	Oil Burners
May, 1943.....	1,926	1,229
P.c. change from May, 1942.	−59.2	−54.4
Jan.-May, 1943.....	9,712	7,785
P.c. change from Jan.-May, 1942.....	−75.2	−79.1

Index of Business Activity*

Week of July 24.....	211.2
P.c. change from month earlier.....	+2.8
P.c. change from year earlier.....	+14.1

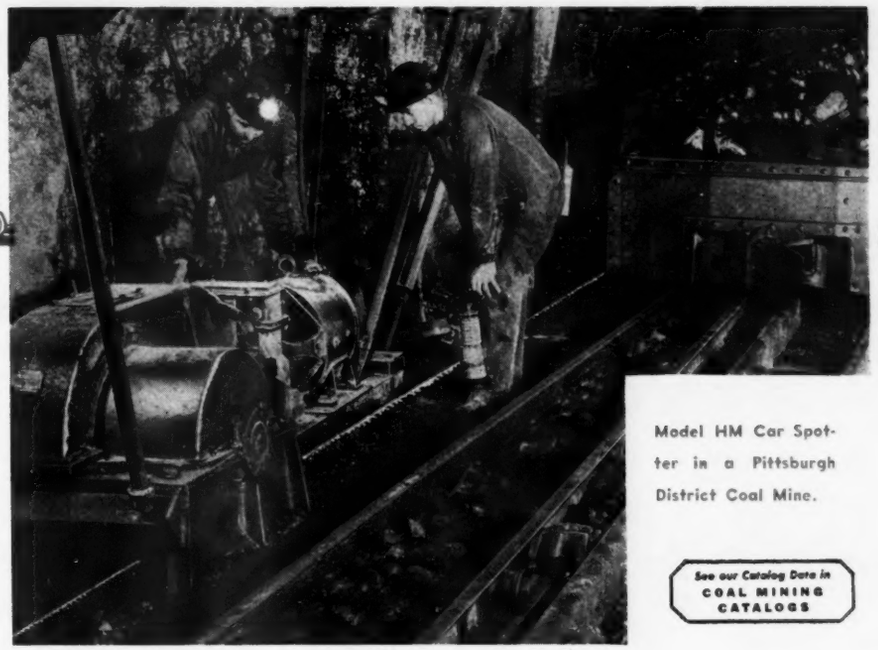
* Business Week, July 31.

Electric Power Output†

Week ended July 24, kw.-hr...	4,196,357,000
P.c. change from month earlier.....	+1.8
P.c. change from year earlier.....	+15.7

† Edison Electric Institute.

A TESTED METHOD
of Keeping Pace with the Loaders



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Back: **"If we're going to keep pace with the loaders, we've *got* to get the cars under the conveyor FAST."**

Forth: **"That's easy, where the boss has equipped our mine with B-F Automatic Car Spotters."**

Back: **"I've watched the B-F work and it keeps the cars under the conveyor when it's handling 6 tons a minute. How can it do that?"**

Forth: **"The B-F Car Spotter moves the trip of cars by means of a barney set in guides between the rails. It pulls the cars ahead exactly one car length, under control of the operator and the limit switch."**

Back: **"Then the barney goes back to its original position, I suppose."**

Forth: **"You're right. And it shifts the cars ahead another car-length, as quick as the operator pushes the button."**

Back: **"How about power?"**

Forth: **"The B-F Car Spotter is rated at 12,000 lbs. line pull at 40-ft. a minute, and a back haul speed of 60-ft. a minute. Plenty of power for a long trip, empty or loaded."**

There are many other TESTED METHODS of increasing production and bettering coal mine maintenance, with B-F coal mine equipment.

The outstanding fact about B-F equipment is that it is *built for coal mine operation*—not a makeshift adapted from some other line of industry or the construction field. Being mining equipment specialists, and living close to our mine friends, we are familiar with coal mine conditions—and meet them—both in the bituminous and anthracite fields.

See the full list of B-F Products opposite. Look them up in the Coal Mining Catalog, or write for our latest Bulletins.

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Pumps
Sheaves
Oil Spray Systems
Tubing Blowers
Mine Cars and Wheels
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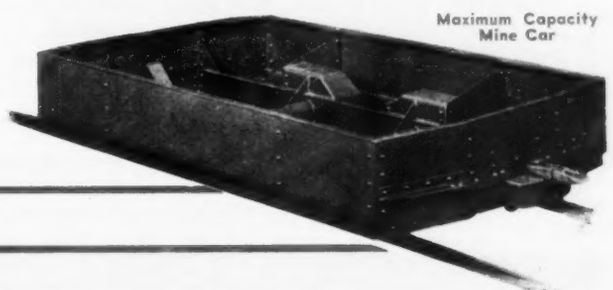
Rerailers

Maximum Capacity Mine Car



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HUSKY TIMBER
FOR AMERICA'S BIG JOBS

The TECO Connector System of timber prefabrication makes it possible to employ timber *efficiently and economically* in heavy structural engineering. Many great war plants, shipyards, docks, warehouses, hangars, bridges, and towers have been built entirely of timber under the TECO Connector System. From the lumber to the finished unit, every step in modern prefabrication is controlled by sound engineering practice. The use of TECO Split-Ring Connectors and TECO precision grooving tools results in a high degree of speed, both in assembly and in erection.

For Modern Timber Construction **Specify TECO** *Timber Connectors and Tools*

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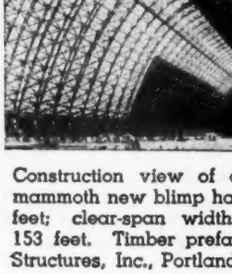
WRITE FOR TECO'S FREE LITERATURE AND LIST OF ENGINEERING SERVICES

3 MILLION FEET OF TIMBER BUILT THIS VAST NAVY HANGAR

Construction view of one of the Navy's mammoth new blimp hangars. Length 1,000 feet; clear-span width 237 feet; height 153 feet. Timber prefabricated by Timber Structures, Inc., Portland, Oregon.



The **TECO** *Ring Connector spreads the load on a timber joint over practically the entire cross-section of the wood . . . brings the full structural strength of lumber into play.*

WASHINGTON, D. C. **TIMBER ENGINEERING COMPANY** PORTLAND, OREGON

"What action has your board taken nce its letter to the President of June 22?

"What merit is there in your taking risdiction in a wage dispute and making finding if you do not obtain compliance ith your order?

"What justification have you for exist- nce if those parties to disputes who carry ut your orders to the letter have their operties seized while the culprit dictates e terms of the seizure?

"What industry or union can respect ur board if it continues to pursue its esent course of conduct?

"The time for action on your part is ng past due. We feel that we have en patient too long. We are submitting is letter to the press and request a ompt public answer or, better yet, some tion on your part."

The situation also was reviewed by lessrs. Ireland and Burke in a letter to mes F. Byrnes, director of the Office f War Mobilization, July 23. They lled attention to their letter to WLB nd asked sympathetic understanding and nsideration of the problems therein esented.

Lewis Offers to Face WLB

John L. Lewis, on the same day (July 3), offered to go before WLB to support he Illinois agreement. In a letter to the oard, Lewis stated his belief that the llinois agreement was "in the public nterest," and added that he was "ready o appear before you in its support in ch hearings as you may elect." Later hat day, WLB set Aug. 3 for hearings on he proposed contract.

Developments at the end of June were atured by, among other things, a WLB tter clarifying its directive on lamp and ol charges, vacation payments, etc. The rovisions were:

"The increased vacation payment shall e applicable to mine workers who enter he armed forces during the last year. The increased vacation payment shall be ubject to such deduction as were the riginal vacation payments during the ast two years.

"Where open lights are used the opera- rs shall furnish them to the mine orkers, including carbide and oil for the mps.

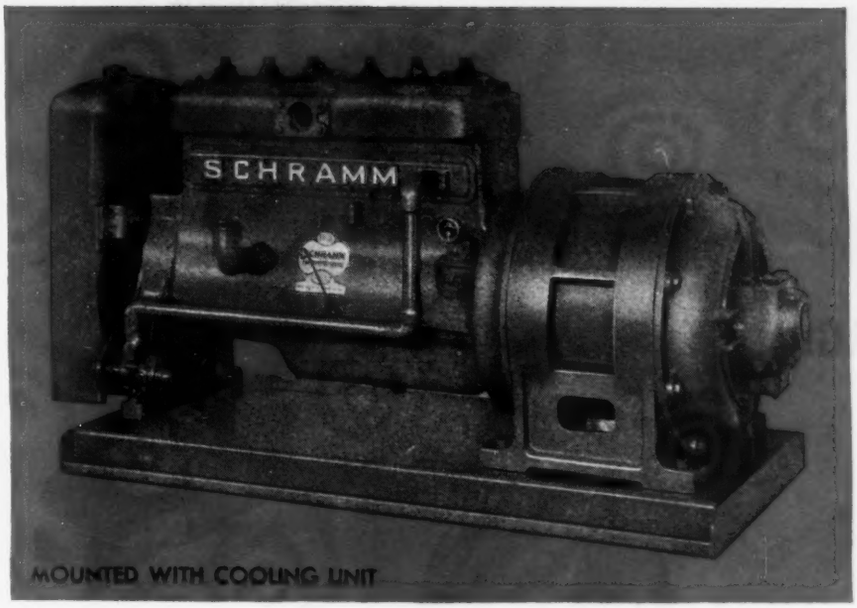
"Explosive boxes, detonator boxes, blast- ng papers and squib boxes are to be urnished in accordance with the wage greements as in the past.

"Tamping bars are to be furnished by he operators.

"Safety hats shall be purchased by the iners as well as all other clothing pro- ided by them.

"All working tools required by mine orkers, and this includes all men work- ng inside and outside the mines, shall be urnished by the operators. Tools to men orking on company houses shall be urnished in accordance with the cus omary practice.

"Management and representatives of the nion in the various districts shall nego- iate the procedure of the deductions for he value of tools and safety equipment hich the mine workers fail to return hen they leave the employ of the mines."



JUST LAY IT ON THE FLOOR

and hook up to current and air lines . . . . . .

In spite of the fact that the SCHRAMM Compressor unit shown above comprises motor, compressor and radiator, it actually is a "one-piece job". All are assembled rigidly and in perfect alignment on a substantial steel base which can serve as a vibrationless foundation. No belts, pulleys, flywheels or water connections are necessary.

Schramm Water-Cooled Air Compressors can be depended on for outstanding performance and satisfactory cooling under all temperature conditions, summer or winter, because water jackets completely surrounding cylinders and heads assure uniform cooling.

If it's a Schramm you can pack a 600 cu. ft. per min. job into a space measuring only 90 ins. x 37 ins. Schramm's vertical, in-line design makes it a neat, compact package, for heavy and continuous service . . . Motor controls for the required starting current and torque can be furnished as a part of the unit or for remote installation . . . Sizes range from 50 to 600 cu. ft. displacement at 100 lbs. pressure.

THE DATA YOU'LL WANT *before deciding on any compressor can be found in our Catalog 42-S. Your request will bring a copy by return mail. Write today.*

SCHRAMM INC.

THE COMPRESSOR PEOPLE
WEST CHESTER
PENNSYLVANIA

2 STRIKES AGAINST THIS CABLE

LOOK OUT FOR THAT 3RD STRIKE..

It's the one that puts the cable, machinery, and valuable copper out of the game. Don't let this happen in your plant. Follow the simple rules for cable care. Post them in a conspicuous place where your workmen can see them every day.

DRAGGING — Never drag a cable. Coil it carefully before attempting to move it. It doesn't take long, yet it does add extra years of operating life to the cable.

MOISTURE — Keep cable out of moisture whenever possible, both when in use and out of use. Just a flick of the wrist is often all that is required to move cable out of a puddle of water. A minute or two is well spent when used to roll a cable reel into a sheltered place.

ABRASION — Avoid unnecessary abrasion which will cause disintegration of cable sheath and shorten cable life, or result in short circuits causing production stoppage.

"TOW LINE" — Electric cable and wire were not designed for use as tow lines for hauling equipment to the place where it is to be used. This will strain the cable, damage it at point of connection to the equipment.

Don't allow cable to kink. If this does happen however, remove the kinks carefully and immediately to prevent damage to the cable sheath. Keep cable out of sun, away from heat such as steam lines and furnaces. Excessive heat ages rubber rapidly, cuts down cable life. Repair cuts, nicks and damaged places on cable sheath immediately. Guard against overloading cable. Don't allow heavy equipment to run over cable.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY *Branches and Warehouses in Principal Cities*

ROEBLING

Meantime, union officials, government operating men and operating companies busied themselves with trying to induce men who had remained out after the union order of June 22 ending the third 1943 stoppage to go back to work. By the end of June, the back-to-work movement among this dissatisfied faction had taken on considerable strength. Early in July, however, a new wave of strikes started in western Pennsylvania, hitting particularly a number of steel company mines. After some blast furnaces had been closed and plans to reopen others had been cancelled, U. S. District Attorney Uhl asked for reconvening of a federal grand jury to inquire into the situation. This action, it was stated, was taken on orders from Washington under the terms of the Smith-Connally War Labor Disputes Act. By July 10, however, the wildcat movement was keeping 26 mines closed.

The grand jury began its deliberations July 14 with Henry Schweinhaut and Irving Hill, special assistants to Attorney General Biddle, presenting the cases with the aid of District Attorney Uhl. With the jury in session, the wildcat movement quickly lost its steam and most of the mines soon were able to reopen.

Strikers Under Indictment

Five indictments charging a total of 30 persons with instigating and directing strikes and otherwise interrupting the operation of 24 Pennsylvania coal mines in possession of the government and in violation of War Labor Disputes Act were handed down as a result of the jury's deliberations, according to an announcement by Mr. Biddle July 26. "The indictments," the announcement stated, "are the first to be returned under this statute and charge violations beginning on June 26, 1943, and continuing to the present. The maximum penalty provided is a fine of $5,000 or imprisonment for one year or both on each count. All defendants are officers or members of local unions of the United Mine Workers of America." The mines employing these defendants were: Isabella, Bridgeport, Filbert, Brownsville Junction, Maxwell, Tower Hill No. 2, Ralph, Shannopin, Crescent No. 2, Vesta No. 4 and Clyde No. 3.

One indictment in 20 counts charges 21 defendants with conspiring to interfere by strike and other interruptions with the operation of all the government-operated mines in Fayette, Greene and Washington counties and thus to bring about a complete work stoppage. The remaining 19 counts in this indictment charge the various defendants with specific acts of interference such as recruiting, securing, transporting and leading of pickets; picketing; inducing and encouraging mine employees to strike; and the calling of local union meetings at which they indorsed, urged and counseled strikes.

A second indictment in three counts charges four defendants with conspiring to interfere by strike and by other interruptions with the operation of certain coal mines in government possession and with specific acts of interference. A third indictment in two counts charges three defendants with similar acts.

A fourth indictment in two counts charges one defendant with instigating and directing strikes and picketing at mines in government possession. A fifth indictment in two counts makes similar charges against another defendant.

With Lewis still sitting tight and WLB pressing for action on its June 18 order, President Roosevelt in effect threw up his hands July 9 when he said he knew of no way of getting Lewis' signature on a contract. He asked what he could do if he sent Lewis a note in longhand on a sheet of pink paper asking him to please conform with the board order and Lewis refused. When reminded that he had ordered Montgomery, Ward & Co. to sign in conformance with a board order, the President stated that sanctions were available in the form of authority to take over the firm, adding that he doubted if there was similar authority for taking over the United Mine Workers.

Say Lewis Gained Point

Following the conference, Appalachian operators wrote to Mr. Byrnes that in view of the President's statement "Mr. Lewis, through his defiance of the government, has gained his point." After hearing the President's views the operators declared they were inclined to feel that "they would have been better off to have joined hands with Mr. Lewis in the making of a contract," and that they were wrong "in trying to support the stabilization program." Requesting some assurance of action, the operators stated that "if the coal industry is to retain its faith in the authority of WLB and the power of your office, it is essential that you give us some assurance that the President's remarks this morning do not constitute capitulation by government to Mr. Lewis."

Assurance that the government intends to return the mines in accordance with the Smith-Connally Act and in spite of Lewis' Oct. 31 deadline was volunteered by the President July 13. On July 14, it was announced that WLB was preparing to adopt a new policy to the effect that it would not insist on signed contracts as long as its orders were complied with. Compliance, the board was reported to feel, was sufficient evidence of intention to carry out its directives.

A wage agreement between the Illinois Coal Producers' Association and the Progressive Miners of America was approved by WLB July 16. The agreements included substantially the terms laid down by the board in its June 18 order in the Appalachian case (July Coal Age, p. 95). The board made the proviso, however, that future orders or directives affecting the United Mine Workers cannot be applied to the Progressive membership without the board's prior approval.

The question of increases to non-mining employees at coal operations to preserve existing differentials was put up to WLB July 16 in a request for blanket authorization for pay hikes for an estimated 20,000 men. Authority to raise wages up to 30 percent was asked by the operators.

Increased vacation pay of $30 was authorized for mine supervisors in a Treasury Department ruling handed down July

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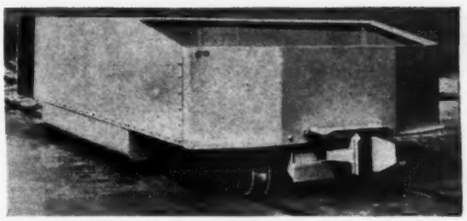

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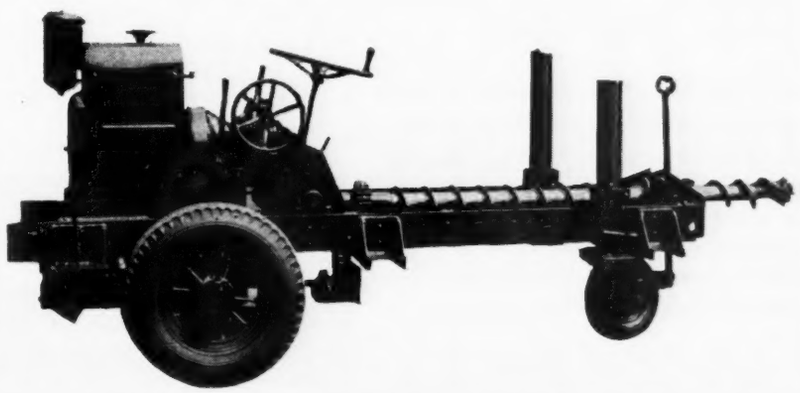

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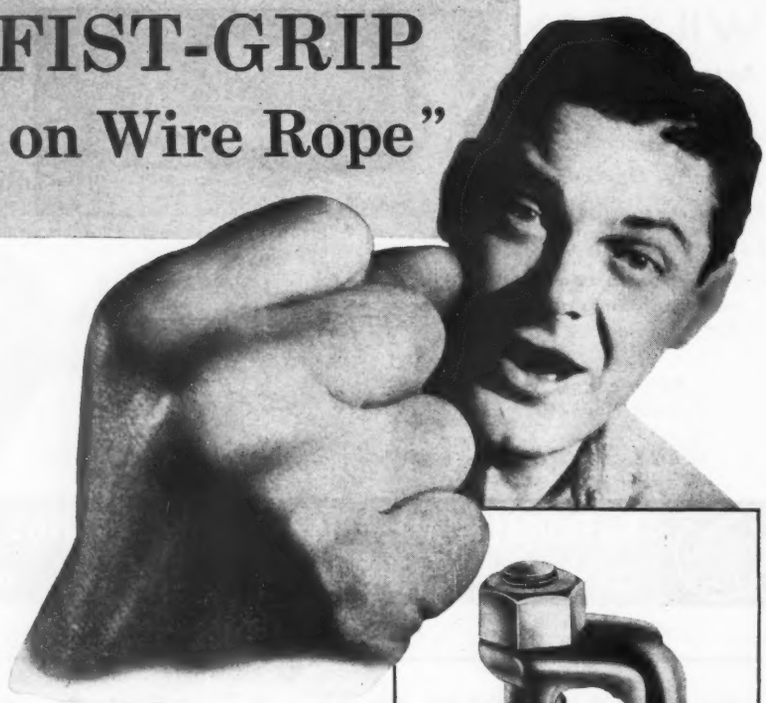
"Save Bullet-Metal for Our Boys' Guns ... with a FIST-GRIP on Wire Rope"



"YOU can save rope, save clips — just as we do — by using Laughlin 'Fist-Grip' Safety Clips, instead of 'finger-pinch' U-bolt clips that crimp and injure wire rope.

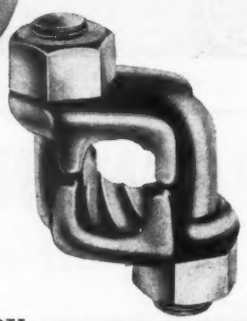
"With 'Fist-Grip' Clips the bolts are on opposite sides — the four bearing surfaces grip like a fist, not a 'finger-pinch'. Three 'Fist-Grip' Clips do the work of four U-bolts! Design is so strong that less steel is needed in each clip. *25% less steel* in all is saved per assembly.

"I figure the rope, clips and steel saved mean more guns and bullets for our boys."

Competitive Tests Prove Greater Holding Power of Laughlin "Fist-Grip" Clips

With 4 U-bolt clips at 37,750 lbs. load, ¾" rope broke at saddle, while only 3 Laughlin Safety Clips held the same load without rope breakage, because extra bearing surfaces grip without crimping. Here's the clip that fights for your country! Investigate!

★ ★ ★ ★



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greater holding power, less work; can't be put on wrong.

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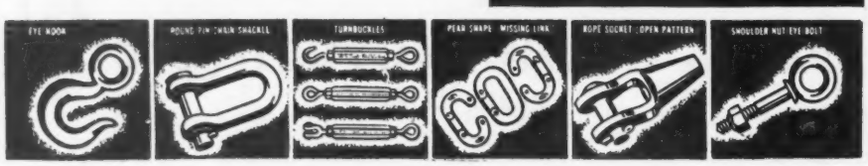
no special-shaped wrench, fewer clips needed, no spoiled rope, 25% less steel.

THE THOMAS LAUGHLIN Company PORTLAND, MAINE



23. Specific Treasury approval for such increases is not required, it was stated.

With most of the collieries again in operation early in July, anthracite operators and miners continued negotiations. The proceedings were transferred to Washington, D. C., July 19 to permit operators to keep in closer touch with developments in government mine operation. The talks were resumed in New York City July 26.

•

Completion of "Big Inch" Line To Ease Oil Tension in East

The world's greatest oil artery became a finished 1,362-mile Texas-to-East Coast 24-in. tube July 19 as welders sealed the final sections of the War Emergency Pipeline near Phoenixville, Pa. Pipe for the 810-mile eastern extension of the "Big Inch" was laid in six months despite extreme winter weather and flood conditions that hampered construction operations throughout almost the entire period of construction.

From Phoenixville, where the 24-in. line terminates, two 20-in. branch lines extend, one to Pennsylvania and Maryland refining centers at Marcus Hook, Philadelphia and Baltimore. The other will feed crude plants near New York, mostly in the Bayonne-Bayway district of New Jersey. Steady progress is reported on the 20-in. products line from the Houston-Beaumont area of Texas. Its completion at Norris City, Ill., is scheduled for Sept. 1, when railroad facilities now moving crude oil from the intermediate terminal of the 24-in. system will be converted to shipment of refined oils.

Pump stations between Norris City and refinery destinations at New York and Philadelphia are approaching completion at a rapid rate, according to Petroleum Administrator Ickes. "We now have reasonable assurance that 'Big Inch' oil," he said, "will be running all the way from Texas to eastern refineries within the next three weeks, the time required simply to fill the huge tube with oil."

Oil deliveries of about 100,000 bbl. a day will start with completion of four of the 15 pump stations now under construction between Norris City and Phoenixville. By Aug. 15, five additional stations will be in operation and oil deliveries stepped up to 200,000 bbl. a day. Designed to deliver 300,000 bbl. a day, the "Big Inch" may actually transport more than that when full operations are attained, according to PAW pipeline engineers.

Agreement on an over-all policy for handling petroleum supply and distribution problems among the War Production Board, the Office of Price Administration, the Petroleum Administrator for War and the Office of Defense Transportation was announced July 2 by Chairman Donald M. Nelson. The principal change set up by the agreement is the establishment of an advisory body, Petroleum Rationing Policy Committee, consisting of representatives of the four agencies and the War Food Administration. The Price Administrator will be chairman of the committee and will make all decisions after obtaining the advice of the committee. Dissents from his decisions may be appealed to Mr. Nel-

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SEALTITE Tamping Bags offer a safer, faster, cheaper, method of sealing shots. Properly tamped holes will cut powder costs and help your blasting crew in bringing down falls. Investigate now—see why they are so widely used.

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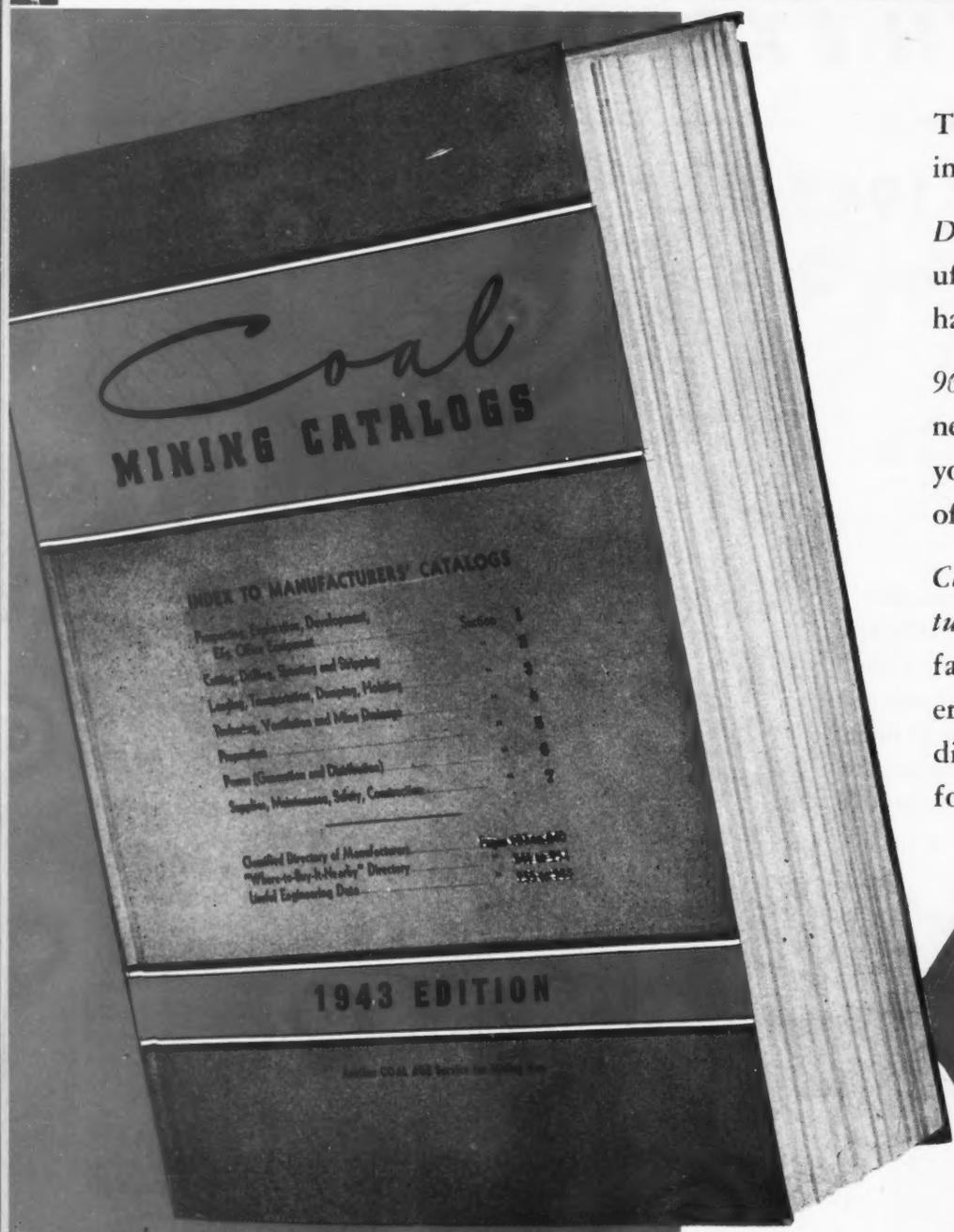

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C.A., Aug., '43

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son. Rationing operations will continue to be handled by OPA.

Petroleum Distribution Order No. 13, replacing the provisions of War Production Board Order L-56, dealing with limitations on the delivery of fuel oil, was issued June 30 by Administrator Ickes. The new order incorporates the provisions of WPB Order L-56 with three important changes:

1. Fourteen new states and that part of Florida west of the Apalachicola River have been added to the territory in which deliveries of fuel oil are prohibited for consumption in new equipment installations or installations converted to fuel oil from other fuels. With this addition the order now covers the entire United States. Exceptions are provided for cases where certain conditions existed prior to July 22, 1943, in the newly added territory. The new states are Alabama, Mississippi, Louisiana, Arkansas, Texas and New Mexico, in the South and Southwest; Idaho, Montana, Utah and Colorado, in the Rocky Mountain area, and Arizona, California and Nevada, in the West.

2. The delivery of fuel oil for weed-control purposes anywhere in the United States is prohibited.

3. Where new space heaters have been acquired under OPA Ration Order No. 9, the delivery of fuel oil is permitted.

With the full support and approval of the Petroleum Industry Marketing Committee representing District 2 (the Middle West), Mr. Ickes has set a minimum goal of 15,000,000 bbl. as the annual saving from the conversion of industrial and commercial oil-burning facilities in the Middle West to the use of coal. The conversion effort will be augmented by a jointly sponsored PAW-WPB program contemplating a reallocation of fuels among various industrial consumers now using either gas, oil or coal or combinations of those fuels, the effect of which also will be a net saving of fuel oil.

Philadelphia's City Council Finance Committee took steps late in June to convert fuel oil-burning equipment to coal in three municipally owned buildings, according to that city's newspapers. Following a warning from WPB that the buildings might be heatless next winter if the plants were not converted, the committee voted $305,000 to change the heating equipment in City Hall, City Hall Annex and the Philadelphia General Hospital.

Petroleum stocks on the Atlantic seaboard are slowly increasing the rate of their recovery from the dangerously low levels of recent weeks, the weekly East Coast Supply Bulletin of the PAW showed on July 3.

•

Legislative Group Studies Stripping Regulation

A subcommittee of the Joint State Government Commission of Pennsylvania—an interim legislative study group—was named early in July to study strip mining in the Keystone State. The proposed study is the result of a compromise following the Legislature's defeat of a bill sponsored by Senators John H. Dent (D.), Westmoreland, and G. Harold Watkins (R.), Schuylkill, which would have drastically regulated stripping. The subcommittee includes: Republicans—Senators J. Fred Thomas, Mercer (chairman); Montgomery F. Crowe, Monroe; G. Harold Watkins, Schuylkill; James A. Geltz, Allegheny; Representatives Edwin C. Ewing, Mt. Lebanon; Earl E. Hewitt, Indiana; Adam T. Bower, Sunbury; J. H. Wallin, Philipsburg; Andrew Garber, Wilkes-Barre; Samuel B. Dennison, Reynoldsville, and Robert J. Cordier, Scranton. Democrats—Senator John J. Haluska, Cambria; Representatives Harry P. O'Neill, Dunmore, and Francis E. Pettit, Washington.

After three weeks' investigation the subcommittee held a three hours' discussion which revealed wide divergence of opinion among operators on the practicability of refilling mined areas. House Speaker Ira A. Fiss, chairman of the commission, declared: "If we can get some kind of a bill that will bring back reasonable contours and forests, that might be part of the solution. It's quite a controversial subject and hardly any two people agree. Our problem is so varied that we might have to draw up one bill for the anthracite region and another for the bituminous."

•

Ash Outlines Raid Rescue To Anthracite Section

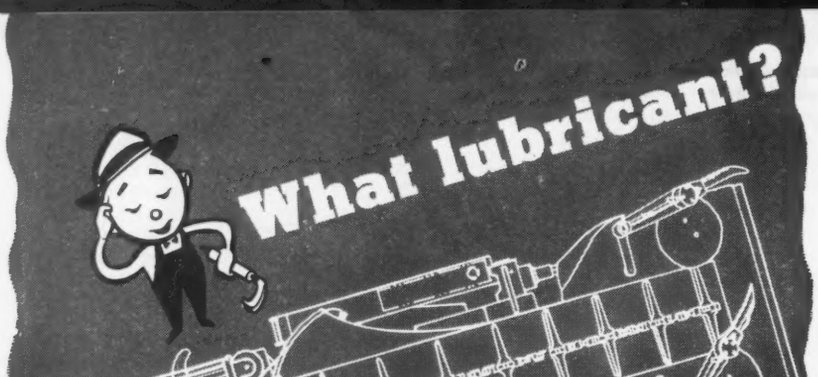
Rescue of those buried in air raids, a most essential part of civilian defense, entirely overlooked in its most important phase in this country, was hampered in Great Britain, as it will be here, by the lack of miners in the cities and even in mining communities to drive and timber the tunnels which it is necessary to excavate through the debris resulting from the dropping and explosion of heavy bombs.

One 500-lb. and two 250-lb. block busters, as he had noted in his trip to Great Britain, declared Lieut. Col. Simon H. Ash, engineer, U. S. Public Health Service, and Chief, Rescue Section, Office of Civilian Defense, speaking at the annual meeting of the Pennsylvania-Anthracite Section, American Institute of Mining and Metallurgical Engineers, Hazelton, Pa., July 10, demolished or damaged in large part 80 brick homes, leaving only a pile of refuse in which lay buried a large number of civilians, some dead, some living.

Usually, for every living person there is one dead person in such a pile, and the only way to rescue these people is by tunneling or trenching, removing the debris in such excavation by hand. One cannot delay the recovery of the living or the dead by cleaning up the pile from its edges. The immured persons, it is found, usually die from shock or loss of blood if they do not succumb to the poisonous carbon dioxide from broken gas lines or are not drowned, when trapped in basements, by water from severed mains.

For this work of recovery carpenters, painters, plumbers or mechanics must be used, and schools to train such men in recovery of these immured victims of a raid have long been established in Great Britain and should be added here to the mechanism of civilian defense. Air raids are not ended in the mother country. While he was across the seas, Col. Ash remarked a real German raid, no mere

"When I tell 'em I used to work in a mine, they up 'n' slaps me on a *mine layer*."



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● THE RIGHT ANSWERS to the questions above will help solve many loader maintenance problems—they'll help reduce delays and increase loader production. Under the stress of wartime tonnage quotas it's extra important to get the right answers. But these answers are not the same today as they were under prewar operation. Neither are they the same at every mine nor for each of your loaders.

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Standard Oil's Lubrication Engineers are doubling their efforts to help mine operators make hard-used loaders last longer. They can analyze operating conditions and recommend lubricants that are exactly fitted for them. They'll work with you in planning new and faster methods of lubrication and new lubricating schedules.

Arrange to have one of these Engineers help you put your loader lubrication on a wartime footing. Test the New Superla Mine Loader Lubricants he recommends. Just call any Standard Oil Company (Indiana) office, or write 910 S. Michigan Ave., Chicago, Ill., for the Engineer nearest you.

New Superla Mine Lubricants include:

No. 3—A dripless oil for fairly tight loader gear cases, and excellent for wick feed oilers on loaders and locomotive bearings.

No. 4—A fibrous type thickened oil particularly for Goodman Loader lubrication.

No. 5—A fibrous type thickened oil for gears and transmissions on Joy Loaders. Particularly useful in reducing consumption.

No. 6—A fibrous type thickened oil for gear cases and gathering head pots on Joy Loaders. Can be applied with pressure gun for bearings.

No. 7—A fibrous type, soap-thickened oil for general mine lubrication underground—for loaders, shuttle car motor gear cases, and conveyor bearing lubrication.

No. 8—A smooth type, heavy thickened oil for armature bearings and make-up in cases requiring a leak-proof lubricant.

INDOILS . . . Three grades of straight mineral oils for hydraulic systems.

No. 41, **No. 75**, **No. 95** } Provide a range of viscosities to meet all loader hydraulic system requirements.

Oil is ammunition . . . Use it wisely

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★ LUBRICATION ENGINEERING

token" demonstration, occurred at least every 24 hours, burying and killing civilians.

He stated that attacks of this kind were to be anticipated on our eastern coasts as made by Germans and on the western coast as perpetrated by Japanese. There are no "humane raids"; invariably such "incidents" result in the death of a large number of persons. That there are no more is due to the fact that the people have protected themselves by entering air-raid shelters. All forms of civilian defense, except that of how to trench and tunnel for the victims, have been given consideration and action has been taken, and Col. Ash urged that this feature be not neglected.

Officers for the coming year, either previously elected or chosen at the session of July 10, are: chairman: Evan Evans, vice president and general manager, Lehigh Navigation Coal Co., Lansford, Pa.; vice chairman: L. D. Lamont, division superintendent, Philadelphia & Reading Coal & Iron Co., Pottsville, Pa.; secretary-treasurer: Floyd S. Sanders, assistant district manager, Goodman Manufacturing Co., Wilkes-Barre, Pa.

Executive committee for one year (carried over): George A. Roos, general manager, Philadelphia & Reading Coal & Iron Co., Pottsville, Pa.; C. A. Gibbons, general manager, Susquehanna Collieries Co., Nanticoke, Pa.; Harry W. Montz, mining engineer, Lehigh Valley Coal Co., Wilkes-Barre, Pa.; W. C. M. Butler, president and general manager, Central Pennsylvania Quarry, Stripping & Construction Co., Hazleton, Pa.; Harold M. Smyth, president, St. Clair Coal Co., St. Clair, Pa.

Executive committee for two years (carried forward): Cadwallader Evans Jr., vice president and general manager, Hudson Coal Co., Scranton, Pa.; Edward Griffith, vice president and general manager, Glen Alden Coal Co., Scranton, Pa.; William H. Lesser, mechanical and electrical engineer, Pierce Management, Scranton, Pa.; Herbert D. Kynor, general manager, East Bear Ridge Colliery Co., Hazleton, Pa.; D. C. Helms, mining engineer, Lehigh Navigation Coal Co., Lansford, Pa.

Executive committee for three years (newly elected): Carroll A. Garner, vice president, Jeddo-Highland Coal Co., Jeddo, Pa.; Harry H. Otto, mining engineer, Hudson Coal Co., Scranton, Pa.; R. Y. Williams, consulting engineer, Pottsvile, Pa.; J. H. Stockett, general manager, Weston Dodson & Co., Shenandoah, Pa.; Robert L. Klotz, district manager, Hercules Powder Co., Hazleton, Pa.

•

Midvalley Breaker Being Revamped

To prepare coal from its Continental mine and from another nearby operation presently being reopened, the Hazle Brook Coal Co., Jeddo, Pa., is revamping the Midvalley breaker, near Mt. Carmel, Pa. The Midvalley operation was closed down in the latter part of 1942 and the mine, as such, was permanently abandoned. Upon completion of the Midvalley breaker revisions, it is reported that the company will abandon its Raven Run breaker.

WAR ORDERS
move on a
checkerboard of priorities

Today, we are confronted with the huge task of supplying war industries with Deltabeston Asbestos-insulated Wires and Cables in quantities that far exceed the highest peak in our history. This unprecedented demand comes at a time when raw materials are scarce and schedules are strictly regulated by those responsible for the direction of the war. So if we sometimes fail to maintain our high standard of deliveries, you must bear with us. We wish our service could be *more* personal, but war orders move on a checkerboard of priorities.

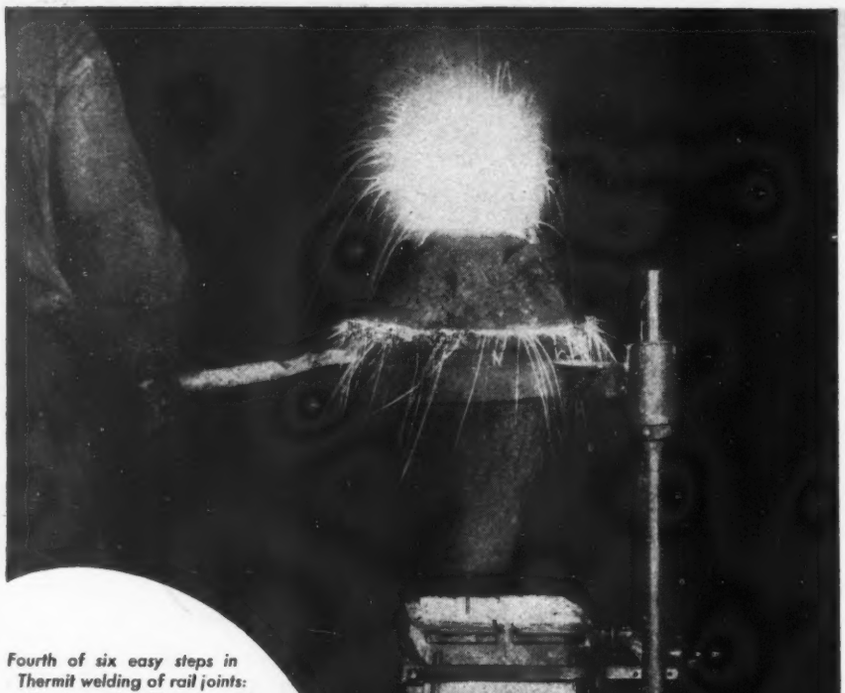
Deltabeston is doing everything in its power to speed up deliveries. We are working day and night, seven days a week to satisfy the ever-increasing demands for Deltabeston Asbestos-insulated Cables. We've expanded with more machinery, more manpower and more buildings, straining all our resources to help speed the day of Victory.

Because of the new conditions imposed by war we are continuously experimenting with new techniques and alternate materials. These experiments have resulted in new types of insulation and protective coverings having definite advantages in quality, appearance or performance. In short, we're learning today to do tomorrow's job better. The full benefit of these improvements will be available to you after Victory. So remember Deltabeston . . . where heat endangers.

Here's the solution to your wiring problem where heat prevails. Just write to Section Y831-10, Appliance and Merchandise Dept., General Electric Co., Bridgeport, Conn. G-E Deltabeston Wires and Cables are distributed nationally by Graybar Electric Company, G-E Supply Corp., and other Merchandise Distributors.

WHERE HEAT ENDANGERS, USE DELTABESTON

GENERAL ELECTRIC



Fourth of six easy steps in Thermit welding of rail joints: Pouring molten Thermit metal. Prior to pouring, rails were aligned and clamped into position, sand mold was formed and mold box clamped to rails. While rail ends were being preheated, crucible was charged. Finally, weld will be cleaned, hammered and ground to railhead finish.

How easy-to-make THERMIT WELDS help you meet peak production schedules

The metal of a Thermit weld is of rail steel quality. The weld is made so quickly and cools so gradually that Thermit welding produces a minimum of internal stresses. The result is a weld of unusual strength and durability ... properties that enable you to transform main haulage track into stretches of smooth, continuous rail that will take everything, and more, that your peak production loads and traffic can give them.

With only a little training under a Metal & Thermit supervisor, your track crew can make Thermit welds. Your benefits start at once. Among them are: a full 45% saving in track maintenance—saving in power—less wear and tear on rolling stock—the elimination, in the construction of new track, of thousands of pounds of critical metals usually used for mechanical rail joints.

Send for the concise, informative, illustrated booklet, "Continuous Rail for Main Haulage Track."

NOTE: Anticipating your Thermit requirements as much in advance as possible you will help us to meet your needs.

METAL & THERMIT CORPORATION

THERMIT

Specialists in welding for nearly 40 years. Manufacturers of Murex Electrodes for arc welding and of Thermit for repair and fabrication of heavy parts.

THERMIT WELDING

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COMING MEETINGS

- National Safety Council: 32d congress and exposition, Oct. 5-7, Hotel Sherman, Chicago.
- American Institute of Mining and Metallurgical Engineers and American Society of Mechanical Engineers: joint fuels conference, Oct 28 and 29, William Penn Hotel, Pittsburgh, Pa.

Mine Union Return to A.F.L. Favored by Tobin

Affirmative action on the application John L. Lewis for reaffiliation of United Mine Workers with the Amer Federation of Labor is favored by Da J. Tobin, president of the Internati Brotherhood of Teamsters and chair of the committee appointed by the A executive committee to confer with Lewis on the miners' application for affiliation. The two other members of A.F.L. committee are Matthew W A.F.L. vice president, and George M rison, president of the Brotherhood Railway Clerks.

Mr. Tobin's views were given in editorial appearing in the *Internati Teamster*, official organ of his organ tion, following which he called a con ence with Mr. Lewis for July 20 in W ington. The conference, held behind d doors, was understood to be for the pose of discussing technical aspects of proposed reaffiliation, including juri tional frictions between the U.M.W. various A.F.L. unions, and to clear way for final action at the A.F.L. execu council meeting in August.

Manpower Survey Launched To Find Hard-Coal Labor

A survey to determine available power in the anthracite region of Pen vania was started July 12 by the U Employment Service offices in the W Barre-Scranton area. Launched as a ernment effort to provide more empl for the hard-pressed hard-coal opera Dr. Frank P. Maguire, area director the War Manpower Commission, nounced that a recommendation had forwarded through the proper chan that any Lackawanna or Luzerne Co mine worker now in the armed forces released if willing to return to the m

Dr. Maguire indicated that a prop was under consideration for holding ferences with local selective service bo to establish provisions not to with any more mine workers for the a forces. Help in mines in the W Barre-Scranton area has been estim at from 5,000 to 10,000 short of the that will be necessary for it to do its in meeting the production total of 65 000 tons set by the government for Efforts in the hard-coal region to in

FREE TO WAR INDUSTRIES

To Help Increase Wartime Production, Cities Service Offers All Essential Industries A Free Industrial Heat Prover Test!

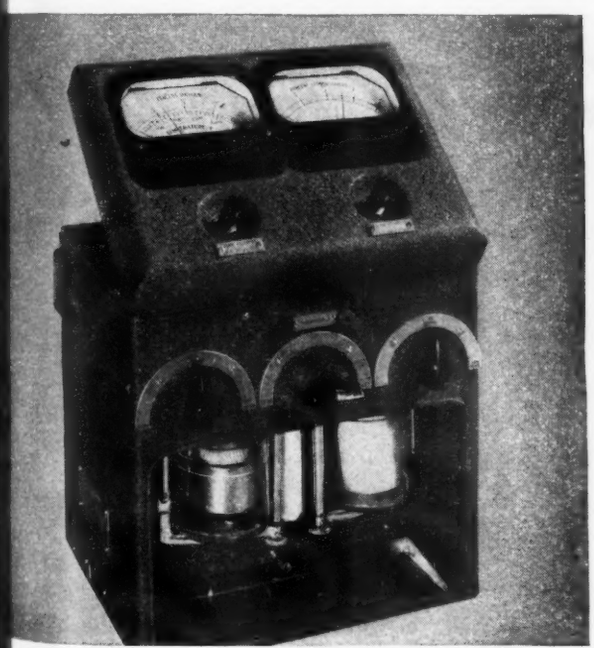
This test helps to solve combustion problems, reveals how fuel can be conserved, and the quantity and quality of the product increased.

Today, a vast majority of our industrial plants still operate without any means of maintaining *accurate* combustion control.

It is to these plants that Cities Service Oil Companies now offer, *without charge or obligation*, a complete combustion control test with the unique, new Cities Service Industrial Heat Prover. This service is available on request in most of the important industrial cities East of the Rocky Mountains.

The Cities Service Industrial Heat Prover has been thoroughly tested on practically every type of combustion equipment in this country and with every kind of fuel.

It has been adopted by users of steam power plants, open hearth furnaces, cement kilns, heat-treating apparatus, crucible furnaces and internal combustion engines.



THE CITIES SERVICE INDUSTRIAL HEAT PROVER—a new, accurate combustion analysis instrument—developed by the Cities Service Research Division to enable those engaged in the oxygen control of furnace atmospheres to achieve greater combustion efficiency at less cost.

Accurate combustion analysis made as a result of the Cities Service Industrial Heat Prover tests have resulted in considerable savings in fuel costs, have reduced repairs and replacements on furnace linings, crucibles and refractories due to flame corrosion . . . and have led to increased production of better and more uniform products.

Wire or phone your nearest Cities Service office or mail the coupon today—for a Cities Service Industrial Heat Prover test in your plant.

A member of the Cities Service engineering staff will then visit your plant at your convenience and make a Heat Prover analysis of your combustion processes. This engineer has been carefully trained for the purpose, and has at his command extensive information gathered by the Cities Service Research Division from power, metallurgical and chemical fields.

CITIES SERVICE OIL COMPANY
Room 1685
Sixty Wall Tower, New York 5, N. Y.

Please arrange a Cities Service Industrial Heat Prover test for my plant. I understand there is no charge or obligation for this service.

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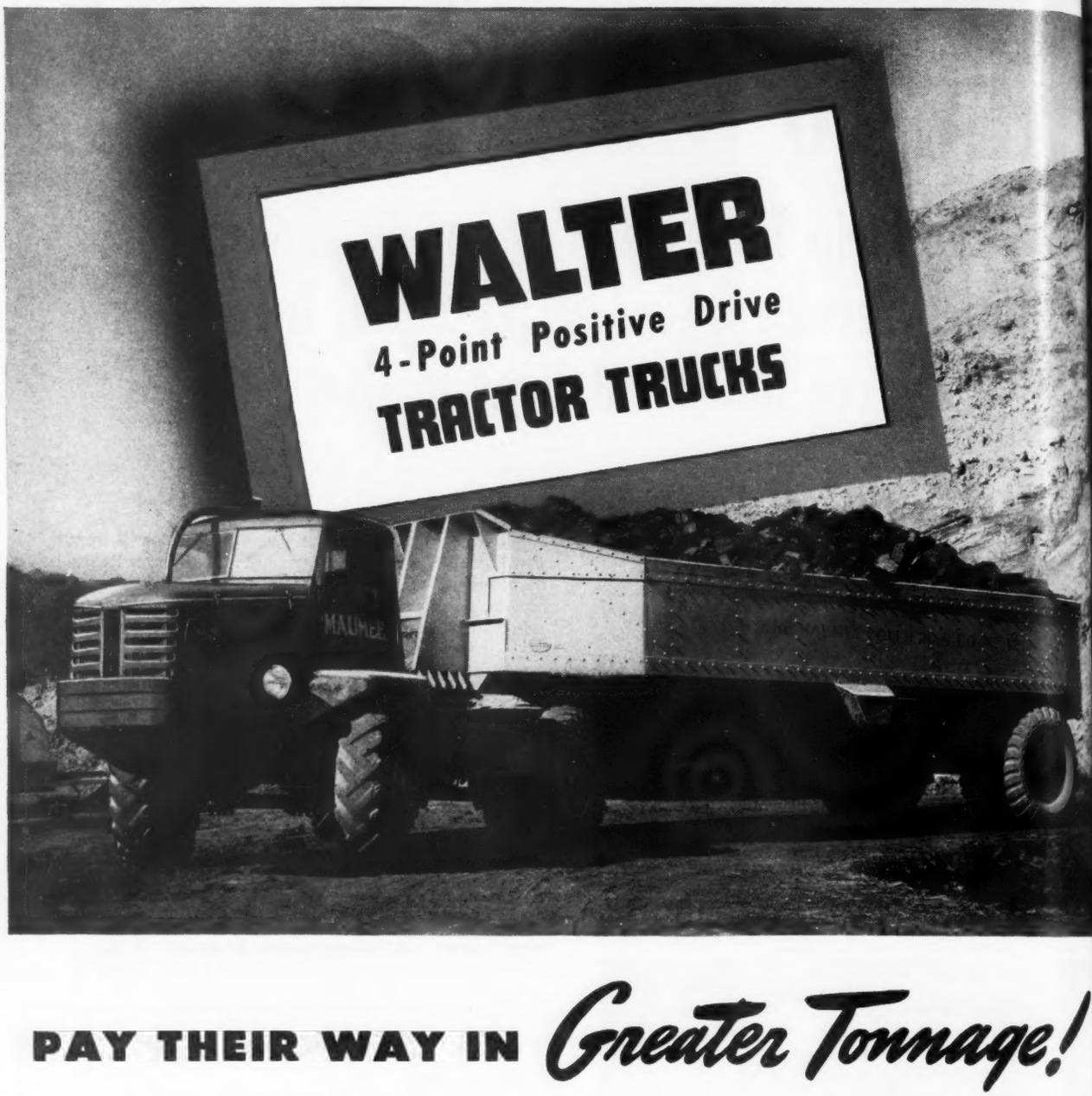


PAY THEIR WAY IN *Greater Tonnage!*

TWO factors enable Walter Tractor Trucks to pay for themselves more quickly than conventional hauling equipment. First, their higher ton-per-hour capacity boosts production and cuts hauling costs. Second, their ability to haul at sustained speeds in any weather or ground condition provides greater yearly tonnages.

Walter Tractor Trucks are hauling up to 50 ton payloads on steep grades and twisting roads, through soft dirt, mud and slippery surfaces that stop other trucks. These hauling feats are made possible by the super-traction of the exclusive Walter Four Point Positive Drive System in which three patented Automatic Locking Differentials proportion the power to each of the FOUR driving wheels according to its traction at any instant.

The details of the Walter Tractor Truck's 175 H. P. Diesel Motor — its Tractor Type Transmission with wide choice of gear ratios — its Suspended Double Reduction Drive and other features, are described in literature sent upon request. Write today for complete information.

WALTER MOTOR TRUCK CO. • 1001-19 IRVING AVE., RIDGEWOOD, QUEENS, L. I., N. Y.

manpower received an additional spur from the action of the U. S. Army on July 20 in authorizing the release of about 4,500 service men with mining experience for work in copper, zinc and molybdenum mines.

•

Urges Post-War Guarantee Of 200-Day Work Year

Warning that failure to renew the Bituminous Coal Act may bring on post-war collapse of the coal industry and the United Mine Workers, the American Council on Public Affairs, in a report prepared by Dr. Richard Kirby and released in Washington, D. C., July 11, advocated guaranteed 200 days employment per year for miners after the war. The report proposed the creation of a common fund by coal operators to finance the 200-day employment schedule.

•

New Pursglove Organization Plans to Rehabilitate

Reorganization of the Pursglove Coal Mining Co., Pursglove, W. Va., preparatory to rehabilitation of its properties has been effected with the following official set-up: George Morse, chairman of the board of directors; Joseph Pursglove Jr., president; Albert H. Hunt, vice president; Robert G. Seaburn, treasurer, and S. Richard Pursglove, secretary. Consolidation Coal Co. has been made exclusive sales agent for the company in consideration for advancing the money for the rehabilitation.

This move was a result of two disasters within six months, the last one, Jan. 8, resulting in the complete shutdown of mine No. 15. According to Joseph Pursglove Jr., "No. 15 mine is now being dewatered and will be back into production in September, soon after which new loading and cutting equipment now under order will start to come in. New offices are being built at Pursglove to house the accounting department and treasurer, moving from Cleveland. Several programs are being launched whereby we expect to boost production to at least 6,000 tons a day within a few months.

"Beginning Aug. 1, all executive offices of the company will be under one roof at Pursglove. A new lease has been entered into with the Cochran Coal & Coke Co. which adds about 4,000 acres of solid Pittsburgh seam coal to the 1,400 acres now leased at the No. 15 mine. This new acreage insures a life of at least 50 years for the No. 15 mine.

"A new airshaft and escapeway is now being put down into the No. 2 mine, which will permit the mining of several thousand acres of Sewickley coal adjacent to the present workings. This will insure a 40-year life for this mine in coal lands now owned in fee by the company. These two Pursglove mines now have greater reserves than almost any other mines in northern West Virginia.

"This long life amply justifies the mechanical and safety programs we are contemplating for both operations. We

1. "So my youngster says to me, 'Pop, what are you doing to win the war?'"
2. "I wish my kid would ask simple questions like that."
3. "Yeah, that was easy. All you had to say was we're the guys . . ."
4. ". . . who keep electrical apparatus on the job for steady war production."
5. "You fellows talk too much. Hurry up with those jobs so I can put a red coat on them."
Buy WAR BONDS
SAFETY FIRST!

PROTECTING ELECTRICAL APPARATUS FOR LONGER LIFE

There's a G-E Insulation for Every Need

These are only 5 of a complete line of insulation materials designed for service under all conditions. For detailed information, write to Section M833-10, Appliance and Merchandise Dept., General Electric Company, Bridgeport, Conn.

GENERAL ELECTRIC

HOW DO YOUR SCREENS COMPARE

Do your vibrating screens provide automatic screen cloth tension . . . prevent rapid wear caused by whipping of screen cloth?

Can you change the screen cloth on any one deck of your screens without touching the others . . . thus cutting down non-productive maintenance time?

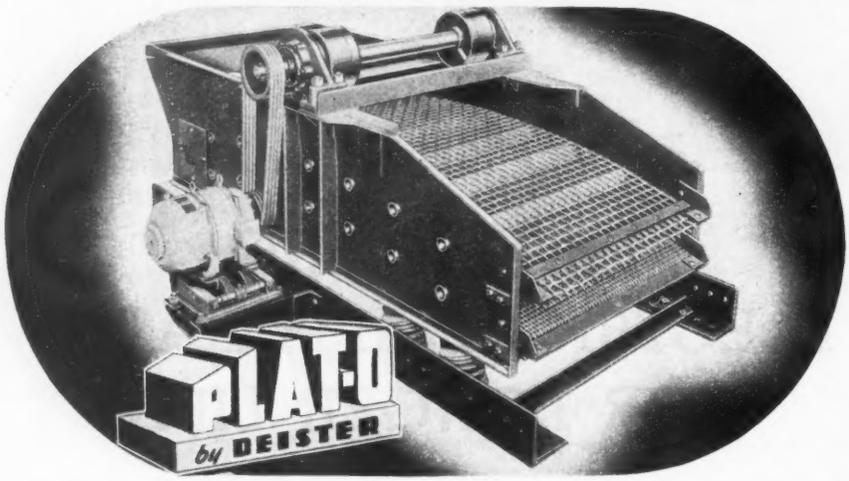
Do your screens give you the protection against bearing troubles . . . protection assured by the use of only two, easily accessible bearings . . . neither of which supports the screen's weight?

Are your screens using power economically . . . giving you more production per KWH—size for size—than any other heavy-duty screen?

If your screens do not have these high-production-at-low-cost features, you do not have PLAT-O Vibrating Screens . . . and if you do not have PLAT-O Screens, we believe we can show you where you can increase your tonnage and your profits by changing over now to PLAT-O.

DEISTER MACHINE CO.

Fort Wayne 4, Indiana



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➡ YOU WANT THE RIGHT KIND of carbon brushes *when you want them. Superior* facilities, growing steadily for 24 years, assure you of just such service. To save your time, get our Reference Catalog No. 7, carefully compiled, without sales talk, on brushes for many types of mining equipment.

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Write us today about a few territories still open.

SUPERIOR CARBON BRUSHES

are going to press safety above every other consideration. Among other things, we plan to install special equipment for fighting mine fires. This equipment will be in the form of fully equipped fire trains ready at all times to be rushed to the scene of a fire. These trains will include tank cars and pumps as well as cars filled with brattice lumber, nails, brattice cloth, rock dust and all the necessary tools.

"With this equipment we will be able to get to a fire before it has any start. We also plan to employ an every-day check system with methane indicators on our main air splits. These will be posted regularly on a main mine-control map so that any areas liberating increased quantities of gas will be immediately discovered."

The Pursglove Coal Sales Corp., Cleveland, a wholly owned subsidiary of the Pursglove Coal Mining Co., will continue to sell coal for a number of other mines for which it is exclusive sales agent. Joseph Pursglove Sr., president of the mining company for the last 34 years, will continue as president of the sales company.

•

Miners in Walkout Ineligible For Unemployment Benefits

Pennsylvania coal miners, both anthracite and bituminous, who participated in the three walkouts in May, June and July are not eligible to collect unemployment compensation for the time they were idle, according to a ruling on July 13 by State Secretary of Labor and Industry William H. Chestnut. In his decision Secretary Chestnut held that miners' unemployment as of and after May 1, the date the government took over the coal mines, was actually due to a strike against the United States. He found the miners "voluntarily leaving work without good cause."

•

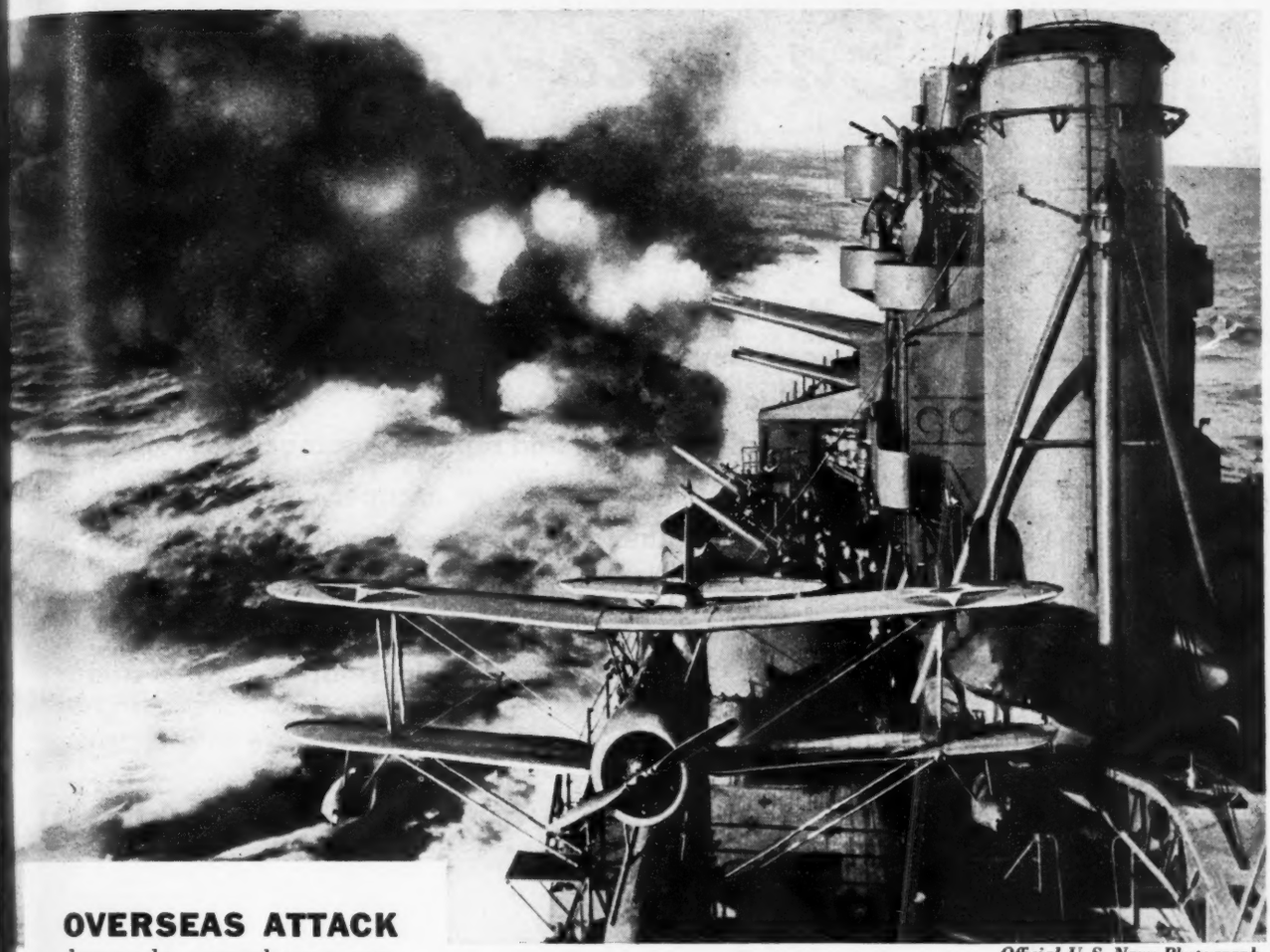
New Preparation Facilities

COAL PROCESSING CORP., Dixiana, Va.—Contract closed with Kanawha Mfg. Co. for mine-run feeder and conveyor, two Robins Gyrex screens, shaking chutes, crusher, conveyors and lump loading boom; timber structure; capacity, 125 tons per hour preparing lump, stoker and by-product sizes.

JONES COAL CORP., Middleport Colliery, Middleport, Pa.—Contract closed with Deister Concentrator Co. for nine SuperDuty Diagonal-Deck No. 7 washing tables; five for treatment of No. 1 buckwheat, two for handling rice, and two for barley size, anthracite.

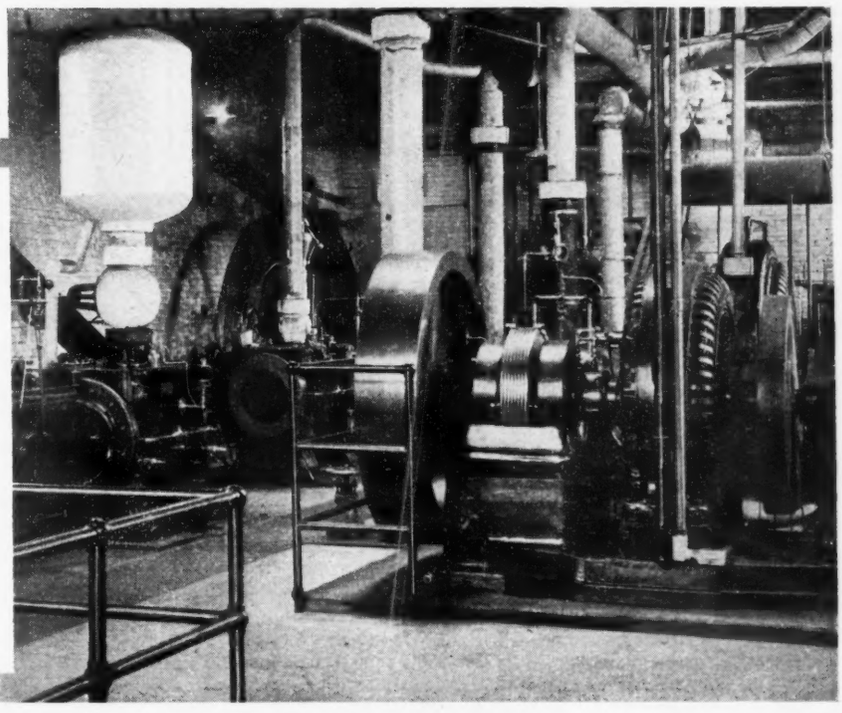
PEKIN MINING CO., Pekin, Ill.—Contract closed with Deister Machine Co. for one 3x6-ft. single-deck Plat-O vibrating screen equipped with 5/16-in. clear square-opening steel-wire screen cloth to prepare stoker coal at rated capacity of 30 tons per hour.

RYON COAL CO., Pottsville, Pa.—Contract closed with Deister Concentrator Co. for two SuperDuty Diagonal-Deck No. 7 washing tables to treat No. 4 buckwheat and barley.



Official U. S. Navy Photograph

OVERSEAS ATTACK demands powerhouse support. To keep *STEAM* engines in continuous heavy duty operation use . . .



. . . SINCLAIR STEAM CYLINDER and VALVE OILS. These oils meet any combination of speeds, pressures, temperatures and moisture conditions. They offer *safe* lubrication in peak load and emergency overload operation.

Write for "The Service Factor"—a free publication devoted to the solution of lubricating problems.

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FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY (INC.), 630 FIFTH AVENUE, NEW YORK CITY

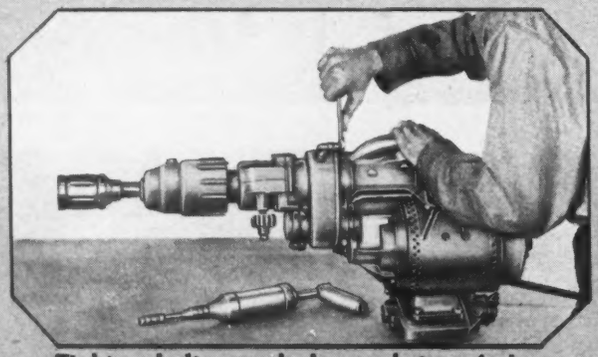
Three Easy-to-do Things

SPEED DRILLING, REDUCE MAINTENANCE

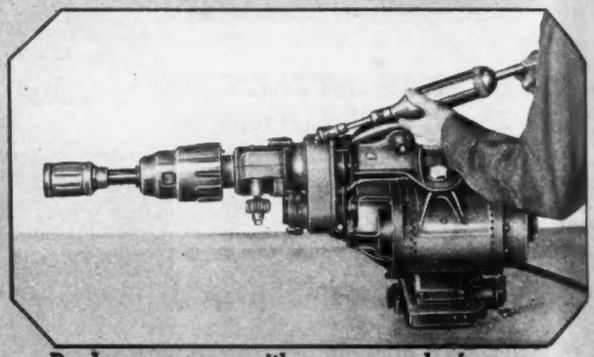
Maintaining a CP Post-Mounted Coal Drill is really very simple, despite the severe service to which the drill is subjected.

Keep all bolts tight and replace missing ones . . . missing bolts allow grease to escape, cause excessive wear on pinion, gears and bearings. Lubricate clutch and gear systematically . . . prevent undue wear. Clean boxing case liner and thread bar regularly — eliminate the friction that burns out armatures and bends thread bars.

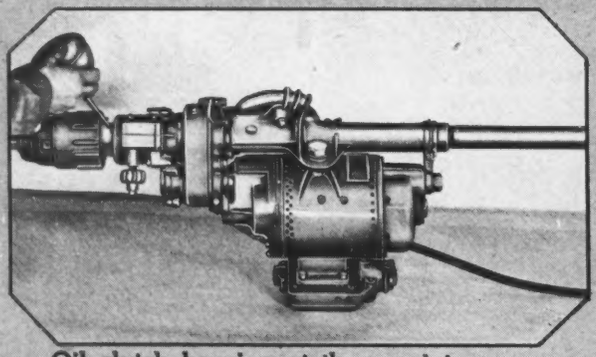
HOW TO GET MAXIMUM SERVICE FROM CP POST-MOUNTED ELECTRIC COAL DRILLS



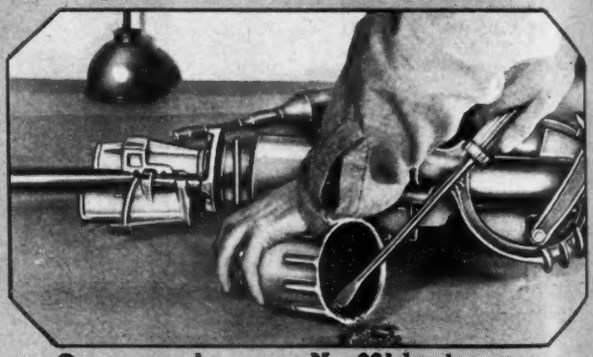
Tighten bolts regularly, replace missing ones to avoid wear on pinion, gears, etc.



Pack gear case with one pound of grease. Clean out, repack when replacing gear hub.



Oil clutch housing at three points every day: 12 drops of oil. DO NOT USE GREASE.



Once a week remove No. 821 boxing case. Clean dust, dirt from case and thread bar.

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
(Hicycle...Universal)
ROCK DRILLS

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★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

STEUBENVILLE COAL & MINING CO., Steubenville, Ohio—Contract closed with Deister Machine Co. for one 5x10-ft. double-deck Plat-O vibrating screen to size 100 tons per hour of 16x0-in. mine-run coal; top deck to be equipped with 2½-in. and bottom deck with 1¼-in. clear square-opening screen cloth.

WALLACE COAL CO., Marion, Ill.—Contract closed with Deister Machine Co. for one 4x12-ft. single-deck Plat-O vibrating screen equipped with perforated steel plate having 2-in. diameter round holes to size a rated capacity of 150 tons per hour of 16x0-in. mine-run coal.

•

Canada Mobilizes Resources To Meet Fuel Crisis

Coal production in British Columbia continues to decline, giving new ground for fears of a fuel shortage in the coast cities of Canada next winter, according to reports. Efforts are already being made to mobilize wood-fuel collection and distribution, and the cooperation of logging and pulp and paper companies is being sought. Meantime negotiations are under way for the building of new roads in the Prince George area to tap sources of coal that in the past have been neglected.

J. G. Turgeon, M. P. for Caiboo, is asking for federal appropriations to cover the cost of connecting the Hudson Hope coal deposits to Dawson Creek. This would provide coal not only for settlers in that area but for thousands of soldiers of the United States and Canada in the northern country, it was stated.

Humphrey Mitchell, Federal Minister of Labor, said on July 14 that Canada must cut and bring to the surface more coal from her own mines to meet the threat of a possible shortage of fuel in future, and appealed to industry, farmers and others who are able to cut fuel wood to do so. In an address broadcast over a national network Mr. Mitchell said that in the last fiscal year Canada used nearly 37,400,000 tons of bituminous coal, slightly less than half of which was produced in the Dominion. More than 19,200,000 tons was imported from the United States.

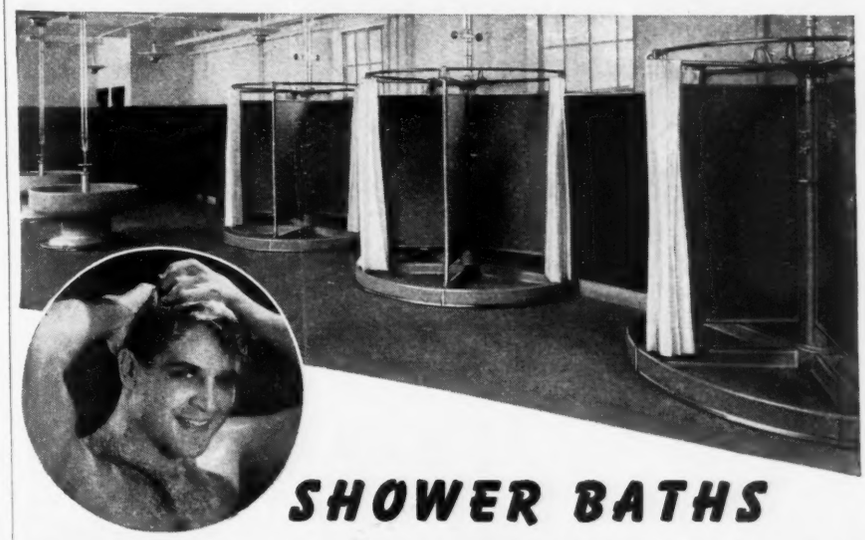
"In order to keep pace with our expanding war economy during the present fiscal year, which will carry us to March 31, 1944," said the Labor Minister, "it is estimated we will require about 4,100,000 tons more than we used last year. To meet this increased production, it is obvious that we must increase our imports of bituminous coal from the United States, or increase our own production, or both. We will hope that there may be available to us as much coal from United States sources as we secured last year."

In a statement July 8 announcing the resignation of Coal Controller J. McG. Stewart, C. D. Howe, Minister of Munitions and Supply, said that the seriousness of the coal situation had caused a steadily increasing amount of work for the controller. The Minister said Mr. Stewart resigned because business reasons made it impossible for him to give full time to the post. Mr. Stewart is being succeeded by E. J. Brunning, president and general manager of Consumers Glass Co., who has been director-general of the Department of Munitions, ammunition and gun production branch. Mr. Brunning, in his new post, becomes chairman of the Emergency Coal Production Board, set up by the government some months ago to take steps to increase domestic coal production.

Associate coal controller—a new post—under Mr. Brunning will be Ian MacLaren of Toronto, president of a coal company.

A long list of recommendations for meeting the expected coal crisis next winter was adopted by Toronto City Council when members indorsed a majority report of the Special Coal Committee. At the same time the Council rejected a proposal for establishment of a municipal coal pile contained in a minority report of Controller Lewis Duncan and Alderman J. B. Salsberg. Also voted down was a suggestion for hiring a full-time official to advise the Coal Committee regarding the coal situation.

Contained in the adopted majority report was a recommendation that the Dominion Government assume control of the fuel business "from the mines and the forest to the consumer" during the period of national emergency. Other recommendations were for a fuel controller appointed by the government for the Toronto area;



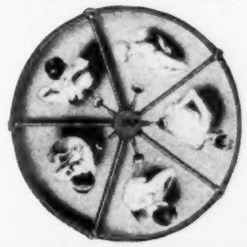
SHOWER BATHS BOOST COAL PRODUCTION

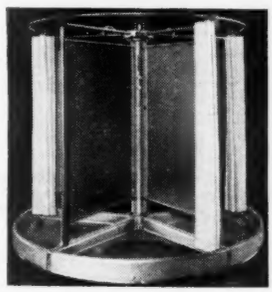
Give your men a chance to wash off grime and sweat—provide adequate wash and shower facilities to keep the men fit for the next day's work.

The experience of all industry points to improved morale and efficiency. Where Bradleys are installed, absenteeism due to Dermatitis and other skin affections is reduced—washing being considered of first importance by industrial physicians.

Bradley Multi-Stall Showers are the shower counterpart of Bradley Group Washfountains, being offered in 5-stall units that reduce piping and piping connections by 80%. Only one set of supply lines is needed for a 5-stall Bradley as against 5 sets of supply lines for five conventional single-stall showers. They come partially assembled for quick installation and save steel because partitions are of moisture-resistant pressed wood.

Install five showers as one unit. Cut piping connections 80%.





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Du Pont "Gelobel" C is a semi-gelatinous permissible used both for underground rock work and shooting coal in wet places. Its velocity is high enough for good rock breakage, yet it gives an excellent grade of lump coal.

Compared with other water-resistant permissibles, it has a high stick count. Therefore, where water conditions formerly required the use of low-count permissible gelatins, "Gelobel" C is economical to use. The dependability of "Gelobel" C is proved by the constantly increasing demand for it by leading operating companies.

Talk with your Du Pont Representative about "Gelobel" C. He has complete information. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington, Delaware.

TIPS FOR BETTER BLASTING

Always use a wooden tamping stick, about the same diameter as the borehole and having a squared end. A pointed stick may override or imbed itself in the cartridge and pull it forward enough to allow "bug dust" to accumulate between cartridges.

DO YOU KNOW THAT...one pound of waste fat will produce glycerin for enough dynamite to blast fifteen tons of soft coal for war production? Urge housewives to save fats . . . butchers everywhere will buy them.

DU PONT
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"GELOBEL" C

Bureau of Mines Approvals

Four approvals of permissible equipment were issued by the U. S. Bureau of Mines in June, as follows:

Joy Mfg. Co.—Types 8BU-10 and 8BU-11 loading machines; 15-hp. motor, 220 and 440 volts, a.c.; Approvals 480 and 480A; June 12.

Joy Mfg. Co.—Types 8BU-10 and 8BU-11 loading machines; 15-hp. motor, 250 and 500 volts, d.c.; Approvals 481 and 481A; June 19.

Ohio Brass Co.—Type FG splice box; Approval 482; June 22.

Joy Mfg. Co.—Type 11BU-8 loading machine; two motors, 50-hp. and 3-hp.; 220 and 440 volts, a.c.; Approvals 483 and 483A; June 26.

pooling of delivery services; examination of profit margins and development of the Alberta coal fields.

The Toronto Board of Control telegraphed Prime Minister Mackenzie King July 6 asking for immediate rationing of domestic fuel in the Toronto area. The decision was made after a motion by Controller Robert H. Saunders, who attacked what he called delay in making definite plans for the coal situation. He said many people are laying in large supplies for next winter, while others are unable to buy an ounce of coal.

O. C. Sturdy, of the Department of Munitions, stated in an address in Toronto July 16 that 1,700 industries in Ontario and Quebec will be closed this winter because of lack of fuel or heavy restrictions in the use of coal. Most of these industries are non-essential, he added, and a survey is being conducted to arrive at final conclusions.

Mr. Sturdy said there probably would be very little anthracite available for domestic use in Ontario and the area in Quebec west of Sherbrooke. School boards will be restricted in their purchases of coal for school buildings. "Some churches, theatres and similar institutions may be closed and Canadians may have to develop a greater interest in heavy underwear and storm windows," he suggested.

The Department of Munitions and Supply announced July 23 that under the order of July 15 by which Quebec and Ontario householders must agree to purchase high-volatile soft coal for one-quarter of their requirements if they are to be supplied with a full year's fuel supply, very fine sizes of coke, hard coal and Pocahontas will be placed in the same class as high-volatile soft coal. Coal Controller E. J. Brunning said any consumer who buys the fine-size coal for one-quarter of his requirements will be permitted to purchase high-grade Class A fuel for the remaining three-quarters of his needs.

The Department of Munitions and Supply reported July 9 in a Canadian House of Commons return that a saving of 1,000,000 tons of coal is expected to be effected by a conservation program in industrial and domestic establishments. The return, in reply to questions by J. W. Mc-

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There are standard CJB Ahlberg Ball Bearings and Bower Roller Bearings for most applications. Whether you are building new equipment or modernizing present equipment, CJB AHLBERG Ball Bearings and BOWER Tapered Roller Bearings will do the job efficiently, economically and satisfactorily.
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Impartial tests conducted by the Pittsburgh Testing Laboratory, proved that MOSEBACH FLASHWELDED RAIL BONDS are as strong as the cable itself. The average breaking strength of twelve Mosebach bonds, selected at random from stock, was within 7% of the rated cable strength of 5,700 pounds. These Mosebach bonds were also shown to be 12% stronger than other competitive bonds tested. Specify Mescoweld Rail Bonds for strength and long life!
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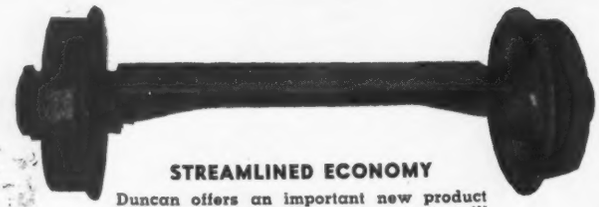

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The following results were obtained by placing two axles in hydraulic press, each bolted flat on face of press and bent to a 30° angle on each end of axle: CAST AXLE . . . 225 tons—ROLLED AXLE . . . 200 tons—neither axle showing a sign of fracture.

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Eliminates the need of

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Carefully controlled chemical properties and careful heat treating of cast steel axles will equal the strength of rolled axles. Cast axle weighs only 125 lbs. complete — eliminating 225 lbs. of weight.

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Duncan is headquarters for all steel mine car wheel and truck requirements; loose and tight wheels with ball, roller, or sleeve bearings; continuous and roller-bearing trucks, etc. Write us about your requirements.

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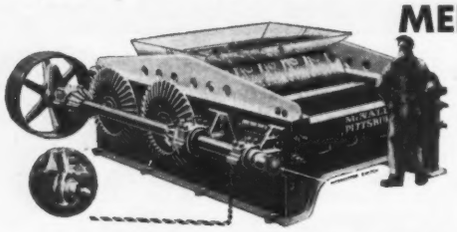

Patented Double Roll Breaker adjustable to produce any size between 6" and 18". Breaks without crushing.

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Gibbon (M.P., Argenteuil), said the available domestic coal stock in Ontario and Quebec at June 1 was 616,678 tons, compared with 981,922 tons on June 1, 1942.

The return also dealt with fuel wood, the Wartime Prices and Trade Board reporting that subsidies paid to June 26 on fuel wood totalled $11,536. The Munitions Department said it was estimated some 7,000,000 cords had been cut this year, compared with 8,000,000 in the corresponding period of 1942. It was expected that about 8,500,000 cords would be available Dec. 1. Plans were being made for a maximum cut to reduce the use of coal and supply war needs.

While imports, largely from the United States, of anthracite have shown an increase of about 105,000 tons during the first five months of 1943 (up from 1,582,194 tons to 1,687,598 tons), imports of bituminous coal have shown a decrease of about 333,500 tons, the total being down from 5,473,183 to 5,139,659. More than a proportional decline for the five months occurred in May, when imports were down by over 163,000 tons from 1,119,515 last year to 956,213.

The Florence colliery in Nova Scotia, which had been idle since July 6, resumed operations on July 19 when coal miners returned to work pending consideration of their case by the Federal War Labor Board. About 700 men became idle after shooters and loaders went on strike for higher wages. At a special meeting, the miners unanimously voted to return to work.

•

Woomer Leaves Warner Co. To Become Consultant

Jerry W. Woomer, general manager of mines for W. H. Warner & Co., operating mines in Ohio, has severed his connection with that company and is now practicing as a mining engineering consultant with offices in the Wheeling Bank & Trust Building, Wheeling, W. Va. In this work he is affiliated with Paul Weir, Clayton G. Ball and George C. McFadden, consultants with offices in Chicago. Since his graduation from Pennsylvania State College Mr. Woomer has been associated also with the Pittsburgh Coal Co. and the Hanna Coal Co.

•

Briquets' Heating Value Aided By Steam-Drying Wyoming Coal

Tests conducted by the U. S. Bureau of Mines have proved that the heating value of briquets formed from Wyoming sub-bituminous coal is about 12 percent greater per unit of weight when the coal is steam-dried preliminary to briquetting, Dr. R. R. Sayers, director, informed Secretary of the Interior Harold L. Ickes July 14 in reporting on another phase of the Bureau's work in promoting more efficient utilization of the nation's reserves of solid fuels.

Because of its tendency to slack and disintegrate, sub-bituminous coal may be

briquetted to facilitate transportation, storage and use. The Bureau's tests, conducted at the Golden (Colo.) field station, employed four commercial asphaltic binders in the preparation of specimen briquets, which were subjected to the following tests: compressive strength, accelerated slacking, abrasion, burning and normal and accelerated weathering. Special equipment was constructed by research workers to conduct the experiments.

While steam-drying sub-bituminous coal stabilizes the briquets to some extent, it apparently imparts no significant improvements in physical properties, said the research workers, V. F. Parry, supervising engineer of the Golden station, and John B. Goodman, associate chemical engineer, whose experiments are described in a publication, "Briquetting Sub-bituminous Coal."

"The heating value of briquets made from steam-dried coal is about 12,200 B.t.u. per pound, compared with 10,000 from briquets made from raw coal," their report explains. "This difference in heating value has important significance when considering transportation costs. The steam-dried briquets stood up better under normal weathering but raw-coal briquets stood up slightly better during accelerated weathering."

Paraffin No Added Protection

Messrs. Perry and Goodman asserted that high concentrations of binder employed in holding pieces of coal together cannot eliminate the tendency of sub-bituminous coal to disintegrate nor does the application of a paraffin coating offer additional protection for such briquets.

For purposes of comparison, the properties of briquets made from Pocahontas low-volatile coal also were studied in the research project.

"Generally speaking, it was found that briquets equal in quality to commercial briquets made from higher-rank coals (such as Pocahontas) could not be made from raw or steam-dried sub-bituminous coal," the Bureau technicians commented.

A copy of the publication "Briquetting Sub-bituminous Coal," Report of Investigations 3707, Department of the Interior, may be obtained from the Bureau of Mines, Washington, D. C.

•

British Research Men See Coal As Only Lasting Power Source

Coal and coal alone can provide the one reliable stable reserve to which our industrial civilization can turn, according to R. G. Bennett, Director of the British Coal Utilization Research Bureau, in opening a two-day conference in London on June 24 on coal structure and its use in the world industrial, chemical, power, plastic and similar industries in the future. Total world reserves of petroleum, both discovered and undiscovered, said Mr. Bennett, are sufficient for only another 60 years at the very accelerated rate of consumption and an oil famine must soon be experienced unless oil prospecting is undertaken in other countries with energy equal to that in the United States.

Oil experts agree with coal research workers that soon the world will have to rely for its power on liquid-coal products. For at least a hundred years the world will rely on coal for the bulk of its supplies of energy.

It has often been asserted that there was no need to worry about the depletion of coal reserves since our successors would rely on energy from the sun or from disintegrated atoms. That might be so, Mr. Bennett continued, but at present there is not the slightest indication in any physical laboratory in the world of a process being developed which could conceivably provide us with great quantities of energy from atomic disintegration.

It seemed to him that trying to find energy from atomic sources under present terrestrial conditions was like trying to find the proverbial needle in a haystack. A lucky shot might give immense returns but there was at present no indication that the odds against success do not far outweigh possible benefits.

On the subject of energy from the sun's rays, he quoted Professor Hottel's figures for a solar energy trap in the deserts of Arizona, the most favorable spot in which this could be attempted. For an effective horsepower installation, the professor calculated that 40 hp. per acre could be generated throughout the year. London, with cloudy and dull days predominating, should be lucky to get 5 hp. and that meant that the electrical requirements of London alone could be met only if the entire Great Britain area were converted

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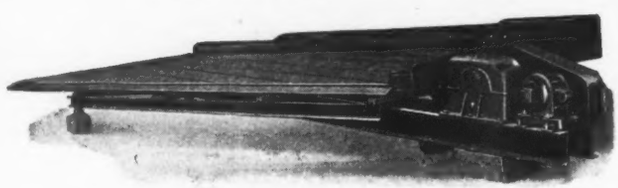
into a sun trap. To give continuous service over the 24 hours, power would have to be stored and at present there is no method of storing intense quanties of thermal or electrical energy except in the form of fuel.

Anything in the nature of a solar trap for energy development means an expenditure far in excess of the installations for the conversion of energy stored in the shape of oil or coal. Very similar conditions apply to the utilization of energy from the tides or the wind. The conclusion to which scientists concerned with power production were forced was that coal, and coal alone, provided the stable reserves to which industry can turn.

This conference was viewed as of very great importance to Britain since its decisions on policy were expected to influence the coal and many similar industries over a long period ahead. Among the many proposals are gasification of coal underground, as in Russia, and the utilization of the resulting products on the surface; establishment of vast oil-from-coal plants, of plastic products from coal, and intensified research into the greatest possible use of coal as a source of power and industrial energy. Oil from coal is particularly desired for postwar transport in Britain and plastics byproducts equally, but power for industry at its most efficient is the real aim of the British scientist and of the government, which has voted £1,000,000 for use in the cause of research.

DON'T LOSE MARKETABLE COAL TO THE REFUSE PILE!



Marketable coal lost to the refuse pile, by inefficient coal washing methods, is a total loss. Insure your coal washing operations against this waste by installing SuperDuty Diagonal Deck Coal Washing Tables. SuperDuty Tables with their extra riffles and separation area assure maximum recoveries . . . increase your daily output of marketable coal and afford large savings of valuable time and labor. SuperDuty Tables are your answer to the demand for tremendous increased coal production.

For complete information on the SuperDuty No. 7 Diagonal Deck Coal Washing Table, write for Bulletin No. 119.

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Federal Inspection Program Stresses Greater Service

Recognized as an important factor in reducing coal mine injuries in the United States and aiding the uninterrupted production of wartime fuel, the federal coal mine inspection program began a new fiscal year with plans for even greater service to the industry, Secretary of the Interior Harold L. Ickes announced July 23.

While coal-mine injuries claimed only percent more lives in 1942, accidents industry as a whole rose an estimated percent, the Secretary said. This record was achieved in the face of increasing demands for coal, the loss of trained workers to the army and to factories and shipyards, and other adverse conditions affecting the industry.

Congress included in the 1944 Interior appropriation bill the sum of $722,880—about $6,000 less than last year—to continue the inspection program through the Bureau of Mines, Secretary Ickes stated, and it is expected that approximately 1,7 mines will be examined during the fiscal year. Reinspection of many mines as an accurate check on improvements also is scheduled.

More than 1,100 of the larger coal mines were inspected in the 12 months just ended, bringing the total to 1,5 visited since the Bureau of Mines inspectors actually went into the field at the beginning of 1942, Dr. R. R. Sayers, Director of the Bureau, informed Secretary Ickes. The coal-mine inspection act was passed in May, 1941, but the selecting and training of the first group of inspectors was not completed until December of the same year. It was August, 1942, before the final group of men entered the field.

The mines inspected thus far represent about 67 percent of the nation's production of bituminous and anthracite coal and approximately 66 percent of the total number of men engaged in coal mining, Dr. Sayers stated.

The Bureau's coal-mine inspection work is confined almost wholly to investigative, recommendatory and educational activities, as the Bureau does not have enforcement powers. Close cooperation with State mining departments and their agents is maintained. Detailed and comprehensive reports, prepared after exhaustive examinations of the mines by one or more of the 117 inspectors and electrical and explosives engineers, are submitted to the operators, mine workers' organizations, and State mining agencies and may be read by the public at Bureau of Mines offices.

Although the 1942 accident record was better than those of years prior to the coal-mine inspection program, the annual toll of life and limb in coal mines still too large to permit a relaxation of effort either in the federal inspection work or on the part of operators and miners, Secretary Ickes commented.

"In the last 12 months alone, 72 men have been killed or injured in the coal mines of the United States," Secretary Ickes said recently. "Coal-mine fatalities (totaling 1,480 in 1942) annually cost the nation a loss of production equivalent to at least 2,000,000 tons of coal a

bring tragedy to hundreds of homes."

Under the federal coal-mine inspection program, the nation's major coal fields are divided into eight districts and a headquarters office functions at a central location in each district. The inspection district offices are at Wilkes-Barre, Pa.; Pittsburgh, Pa.; Mount Hope, W. Va.; Birmingham, Ala.; Vincennes, Ind.; Duluth, Minn.; Dallas, Texas; and Salt Lake City, Utah.

Hundreds of major improvements already have been effected in coal mines in response to these recommendations, surpassing even the most optimistic forecasts of the program's sponsors, Secretary Ickes reported. These improvements, for which the groundwork often has been laid through years of effort by State coal-mine inspection agencies, include better ventilation, haulage, roof control, and dust reduction or control, the safeguarding of electricity and electrically operated equipment, the elimination of water hazards, and the adoption of safer explosives and safer methods of handling and using them. Many operators have asked and have been given aid in solving special problems dealing with ventilation and other subjects.

Although there have been a few criticisms of the program, the scores of commendatory letters from mine operators—some of whom opposed passage of the act—as well as mine workers and their representatives, have indicated the industry's willingness to support and cooperate with the federal coal-mine inspection program.

The mines already visited were producing 431,187,908 tons of coal annually at the time of the inspections, or roughly 67 percent of the nation's tentatively computed 1942 output of 637,100,000 tons. They employed 350,506 men, or 66 percent of the 532,500 men estimated to have been employed in coal mines of the United States in 1942. Those inspected included 62 percent of the 2,500 mines employing more than 25 persons each. Some inspections also have and will be made of mines employing less than 25 men, of which there are approximately 14,000.

The mine-safety movement still has far to go, Secretary Ickes remarked, for National Safety Council tables show that mining as a whole has an accident frequency rate more than double that of the average of 31 major industries and an accident severity rate six times as great as that of the average of the same industries. Moreover, mining ranks next to the worst of the 31 in frequency and the worst by far in severity, and coal-mining accident rates are higher than those of metal mining.

•

Anthracite Industries Expands Service

With the largest staff in its history, the Anthracite Industries' laboratory at Primos, Pa., has been enabled still further to expand its program of development and cooperation with heating equipment manufacturers, according to Frank W. Earnest Jr., president of that research and educational organization of the hard-coal industry. Other important activities reported by Mr. Earnest include the inauguration of an intensive fuel conservation campaign among consumers and the completion of a stoker service survey.

More than 40 fuel engineers and technicians are now engaged in research on anthracite combustion and heat transfer methods, systematic testing and improvement of anthracite-burning equipment of all types, and engineering analyses of data from all sources. Many of the new employees are from the anthracite-producing region, among them two high school teachers who are working for the summer to obtain special experience.

Because it is estimated that at least 10 percent of the coal annually used for domestic heating is wasted through dirty and faulty equipment, Anthracite Industries, Inc., has embarked on an intensive campaign to encourage anthracite users to clean and repair their heating plants this summer. As many dealers are faced with a shortage of manpower, as well as restrictions on gasoline and tires, the public is urged to do the job itself and to call upon the dealer only for major repairs.

To emphasize the importance of eliminating waste through dirty and faulty equipment as well as that occasioned through improper firing and operation of heating plants, "how to do it" stories and articles are being placed with newspapers, trade and general magazines, and radio

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is a Popular old Soul-

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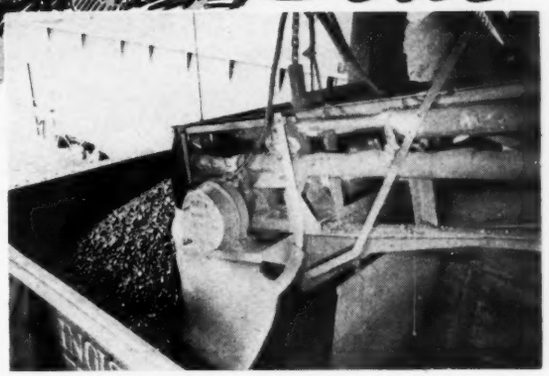

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WHEN it gets right down to cases, coal is the fuel the nation depends upon. Modern stoker firing has boosted coal's stock, removing many of its disadvantages.

But stokers won't stoke iron!

You can help make coal the most desirable fuel and hold many of the customers who have been forced from oil to coal if you'll give them *iron-free stoker coal.*

Dings, world's largest exclusive manufacturer of magnetic equipment, offers you a complete line of electro-magnetic pulleys, spout magnets, suspension magnets and magnetic drums to provide positive automatic or semi-automatic iron removal.

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stations serving the anthracite marketing area.

To make certain that users of domestic anthracite stokers receive adequate and proper attention, the field staff of Anthracite Industries, Inc. has completed a survey to determine what effect wartime conditions have had on the servicing of such equipment by dealers. Principal findings are: most consumer complaints requiring emergency service during the 1942-43 heating season were promptly and satisfactorily handled; repair and replacement parts were readily obtainable; in general, dealers are rendering over-all service equivalent to that of the pre-war era; and fewer minor complaints are being received by stoker dealers than formerly.

Ickes Acts to Promote Maximum Mine Safety

Measures to effect maximum safety in the operation of the coal mines under the United States Government were announced July 6 by Coal Mines Administrator Harold L. Ickes.

Acting after consultation with Deputy Administrator Carl E. Newton, Administrator Ickes issued an order directing full compliance by the federal mine operating managers with statutory requirements for the protection of the health and the safeguarding of the mine workers. Also, the order directed mine operating managers to report the extent to which they comply with the safety recommendations made by Bureau of Mines inspectors under the Federal Coal Mine Inspection Act.

In issuing the order, Administrator Ickes said:

"Federal operation of the coal mines places the responsibility upon the U. S. Government that the mines are kept safe. Both as a humane measure and as a means of helping to achieve the maximum production of coal to win the war, the Federal Coal Mines Administration will act vigorously to bring safety and health conditions fully up to the legal standards.

"Since Pearl Harbor, more men have been killed and injured in the coal mines of the United States than have been reported killed, wounded and missing in action by all branches of the armed forces. Last year 1,480 men were killed in the coal mines, and 70,500 were injured. Although this terrible loss of life and limb in the coal mines during the last year is less than that of previous years and better than the record made prior to the establishment of the federal coal mine inspection system, it, nevertheless, is a commentary on the hazards in the industry.

"With the growing pressure upon the mines to increase production, and as the result of other influences of the war upon the operation of the mines, deaths due to mine accidents appear to be increasing. At the rate experienced during the first four months of this year, we may expect that 1,500 men will be killed in 1943 unless we can do something to prevent it. Every man we lose on account of death or injury by accident means not only grief and loss to his family but also loss of production. The heavy damage to mining properties and precious equipment also means loss of production. For the most part, accidents are preventable, and we must act vigorously to prevent them."

Safety to Boost Output

In recommending the issuance of the order to tighten up safety measures, Deputy Administrator Newton told Mr. Ickes that the result would be to increase mine output in four ways:

1. Preventing the killing of men in accidents will conserve irreplaceable and diminishing manpower.

2. Providing larger quantities of fresh air in the recesses of the mines where the men work will stimulate productive effort, in addition to improving safety.

3. The prevention of mine explosions will save the loss of operating time, mine development, and critical machinery and materials.

4. Improved morale of the mine workers resulting from maintaining maximum safety standards would be reflected in higher production.

"Even at the best it will be a difficult job to get out the coal we shall need, and we must overlook no practicable way of increasing mine production," Mr. Newton said.

"I shall act vigorously to maintain maximum safety standards in the mines, not only for the sake of the men and their families but as an effective way to increase production of coal.

"Good ventilation, proper rock dusting, the maintenance of electrical equipment in

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HELP KEEP PRODUCTION ON SCHEDULE

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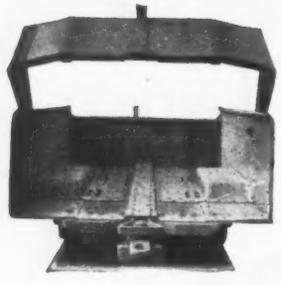
Ruggedly built for *three shift* production, these All-Steel Mine Cars are moving maximum loads every hour around-the-clock.

Our engineers will be glad to make recommendations on the type best suited for your requirements. Bulletin 66 sent on request.



Note the exclusive design feature of this Low Height Rotary Dump Car—Combination flanged side sheet and heavy "Z" bar, provide rugged top chord construction, with shelf for holding car in dump. Top leg of "Z" bar is riveted and bottom leg is welded to side plate.

PRESSED STEEL CAR COMPANY, INC.
INDUSTRIAL DIVISION
PITTSBURGH, PA.

safe operating order, more caution by the employees, and many other measures are means whereby to make the coal mines safer, and hence more effective, place to work."

The text of the order follows:

"Pursuant to the provisions of Executive Order No. 9340 of May 1, 1943 (8 F.R. 5695), and to carry out its purpose, I hereby order that:

"(1) Operating managers of mines in the possession of the government shall operate the mines in full compliance with State and federal laws and regulations for the protection of the health and safety of the workers; and

"(2) Operating managers shall report to the Bureau of Mines of the Department of the Interior the extent to which they have complied with the recommendations made as a result of inspection of the mines by a federal coal-mine inspector. The report shall be made within such time as the recommendations shall specify and if no time is specified, within 60 days after the receipt of such recommendations in writing."

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Britain to Draft Boys For Work in Mines

It will be necessary to draft British boys from 16 to 18 years old to work in Britain's coal mines to boost lagging output of coal for the nation's war industries, Ernest Bevin, Minister of Labor, told the Blackpool Mine Workers' Federation July 21. Urging the federation not to raise a political storm over the issue, Mr Bevin said it was urgent that 30,000 to 60,000 youths be called up.

He revealed that although 47,000 workers have returned to the mines from other higher-paid jobs, the number of miners has fallen to 690,000. He estimated the absolute minimum needed to keep production at the necessary level at 720,000 to 750,000.

Hitherto boys reaching the draft age have been given the choice of going into the armed forces or into the mines, but Mr. Bevin said that so far only 3,000 have taken mining jobs in preference to 50c. a day service with the army and navy.

•

Urge Rigid Paper Conservation As Pulp-Wood Pinch Grows

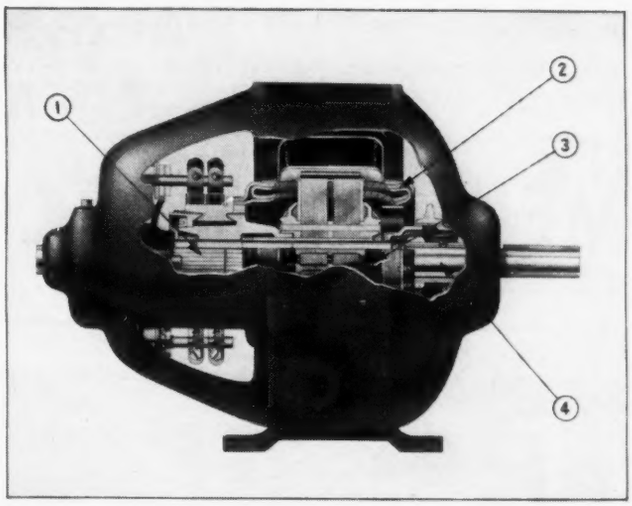
Faced with a constantly diminishing inventory of pulp wood and a waning supply of pulp, the printing and publishing committee, Associated Business Papers, is working hard in cooperation with the Printing and Publishing Division, W.P.B., O.W.I. and the Bureau of the Budget to cut down the use of paper by the United States Government. On its own part in the conservation program A.B.P. propounds five guiding questions which every management should ask about every piece of written or printed matter which it orders and uses:

1. Is it necessary?
2. Can lighter paper be used?
3. Can a smaller size be used?
4. Can the number of printed pieces be reduced by pruning distribution lists?
5. Is an excessive inventory of paper on hand? (Sixty days is today's allowable margin; six months the peacetime average.)

War Production Board officials urge every top management to make a competent operating executive responsible for the application of these principles in each plant. And here is a brief check list for the further guidance of the paper saver:

1. Use 8½ x 5½-in. letterheads for short letters; inclose them in small envelopes.
2. Review all printed forms periodically for essentiality; consolidation; elimination of waste space; standardization of sizes, weights, color, grade; elimination of color where possible.
3. Use smaller type sizes and margins. (Any competent printer, in consultation, can point the way to pronounced savings by these means.)
4. Cut the weight of paper stocks. (You tell the printer how long you expect a record to endure and he can tell you what stock to order.)
5. Condense letters and memoranda by (a) keeping margins as narrow as possible; (b) sticking to single-space forms; (c) using reverse side of incoming letters as first carbon copy of replies; (d) using

Where to Hunt Trouble



on a Sleeve-Bearing Motor

On sleeve-bearing motors in coal mine service, you don't have to look far for trouble. On a D.C. Motor you may find (1) a scored commutator, due to carbonized oil; (2) coils encrusted with oil and dust, and (3) air passages blocked, causing over-heating; (4) worn bearings.

Replace with

KEYSTONE

BALL-BEARING

END BELLS

AND PREVENT THESE TROUBLES. Then grease replaces oil as a lubricant, and is held in the bearings by felt seals. We send you complete installation, ready to apply in your own shop, at reasonable cost.

Send for Detailed Information

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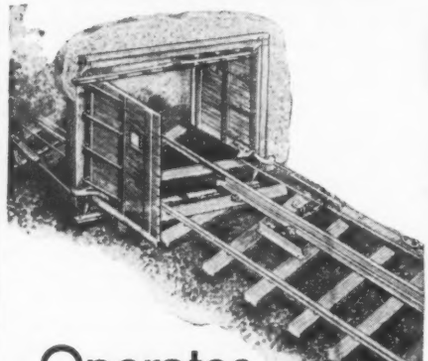

Door Safety Pays—

Operates Mechanically

Note the illustration showing sturdy mechanical construction of operating parts. Before reaching the door, car wheel activates the mechanism which throws the doors open instantly. When last car passes beyond mechanism on the other slide, the doors automatically close instantly. Install these self-paying American Doors throughout your mine to safely increase output.

The American Mine Door pays for itself over and over again by permitting trips to go through at regular operating speeds. no stopping—no starting—no delay at the door. It eliminates the trapper-boy job, or snapper jumping off to open and close the doors. It, therefore, eliminates that possibility of an accident at the same time. It helps to maintain air flow velocities to carry away and dissipate gases. Any way you look at it, the American Mine Door saves money, increases production, prevents accidents. Write for complete catalogue.

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STEEL GRID RESISTORS

for

HEAVY DUTY SERVICE

in COAL MINES

★ LOCOMOTIVES
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P-G *"The Resistor you can Install and Forget"*

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reverse side of second sheets for carbon copies; (e) using both sides of all mimeographed sheets.

6. Control disbursement of paper supplies to employees so that excessive quantities do not accumulate in desks and departmental supply closets.

7. Make scratch pads from stocks of obsolete letterheads, memorandum forms and other unused inventory.

8. Use and reuse carbon paper consistently.

•

Praco Tipple and Washery Destroyed by Fire

Fire July 28 practically destroyed the tipple and washery at the Praco mine of the Alabama By-Products Corp., Praco, Ala. The mine produces about 3,000 tons daily and officials announced that partial production would be resumed in a few days. Some of the miners will be temporarily transferred to other operations of the company.

•

To Explore Coal Possibilities Of Vancouver Island

Extensive exploration of the geological possibilities of northeastern British Columbia and examination of the coal-bearing areas of Vancouver Island are projects included in the Dominion and Provincial governments' field work this year, according to an announcement by E. C. Carson, Minister of Mines.

"Dominion and Provincial government parties have begun geological mapping and investigations which are directed toward the discovery and investigation of deposits of war minerals, petroleum and coal," said Mr. Carson. "Much of this work is to be done this year in northern British Columbia in the area served by the Alaska military highway or which may become tributary to the highway if lateral roads are built."

•

How to Combat Fires Explained In Training Manual

Industrial fire brigades training manual, 184 pages, published by the National Fire Protective Association, is designed to meet three widespread needs: (1) as a training manual for employees assigned to carry out fire-fighting duties under direction of the chief of the private brigade; (2) as reference book in plants where a fire brigade already is organized but where the experience of a large group of experts can be profitably utilized; (3) in plants needing the essentials but not the details of large-plant fire-protection organization.

Divided into 16 chapters, the book covers the following: the industrial fire brigade; forcible entry practices; rope work; fire extinguisher practices; hose practices; salvage and overhaul practices; fire streams; ventilation practices; periodic inspections of plant fire-protection equipment; care of fire brigade equipment; fire causes and

fire hazards; fire-fighting procedure; flammable liquid and gas fires and special extinguishing systems; electrical fires; gas masks and rescue practices.

•

Almost Perfect Score Compiled By Colver First-Aid Team

With an almost perfect score of 99.73 percent, the Ebensburg Coal Co. team, Colver, Pa., took first place in the Joseph A. Holmes Association first-aid meet held July 10 in the Barnesboro (Pa.) Municipal Stadium. Two teams tied for second with a score of 99.33, the Red Lands Coal Co. team, Heilwood, winning a toss for the honors from the Sterling Coal Co. team, Bakerton. Members of the winning team received $15 each; second, $10; third, $5.

Eighteen teams took part, the closeness and excellence of the competition being attested by the fact that the lowest score recorded was 97.93. About 4,000 witnessed the meet, a feature of which was an address by Richard Maize, Commonwealth Secretary of Mines.

O. J. Flanagan, Spangler, was director of the meet; W. Garfield Thomas, Deputy Secretary of Mines, awarded the prizes; Thomas Lowther, retired mine inspector, and W. B. Wardrop, inspector, 23d Bituminous district, were timekeepers; George Grove, U. S. Bureau of Mines, was chief judge, aided by the following supervisors, all from the Bureau of Mines: F. J. Craig, Eugene Quenon, M. J. Ankeny, Harry Burdelsky, Edward Lewis, F. A. Magistrella, C. J. Dalzell, A. J. Barry, Patrick Loughny, Joseph Rejonis and C. E. Newman.

•

Coal-Mine Accident Fatality Rate Lower Than Year Ago

Accidents at coal mines of the United States caused the deaths of 101 bituminous and 19 anthracite miners in May last, according to reports furnished the U. S. Bureau of Mines by State mine inspectors.

With a production of 47,855,000 net tons, the accident death rate among bituminous miners in May last was 2.11 per million tons, compared with 3.24 in May, 1942.

The anthracite fatality rate from accidents in May last was 3.64 per million tons, based on an output of 5,223,000 tons, against 4.34 in the fifth month of last year.

For the two industries combined, the accident fatality rate in May last was 2.26, compared with 3.34 in the corresponding month a year earlier.

Fatalities during May last, by causes and states, as well as comparable rates for the first five months of 1942 and 1943, were as follows:

UNITED STATES COAL-MINE FATALITIES IN MAY, 1943, BY CAUSES AND STATES

State	Underground: Falls of Roof	Haulage	Gas or Dust Explosions	Explosives	Electricity	Machinery	Other Causes	Total Underground	Shaft	Open-cut	Surface	Grand Total
Alabama	1	3	12	..	..	..	..	16	..	..	..	16
Arkansas	..	..	3	..	..	..	..	3	..	..	..	3
Colorado	1	..	..	..	..	..	..	1	..	..	..	1
Illinois	4	1	..	..	..	1	..	6	..	..	..	6
Indiana	..	2	..	..	..	..	..	2	..	..	..	2
Kentucky	3	1	..	..	1	1	..	6	..	..	..	6
Missouri	..	..	..	..	..	..	..	..	..	..	1	1
Montana	1	..	..	..	..	..	..	1	..	1	..	2
Ohio	1	..	1	..	..	..	..	2	..	..	..	2
Penna. (bit.)	10	3	..	..	..	..	1	14	..	1	1	16
Tennessee	..	2	10	..	..	..	..	12	..	..	..	12
Utah	..	1	..	..	..	..	..	1	..	..	..	1
Virginia	8	..	..	..	..	..	..	8	1	..	..	9
Washington	1	..	..	..	..	..	..	1	..	..	..	1
West Virginia	10	6	..	..	1	..	1	18	..	..	2	20
Wyoming	2	..	..	..	1	..	..	3	..	..	..	3
Total bituminous	42	19	26	..	3	2	2	94	1	2	4	101
Pennsylvania anthracite	10	2	1	2	..	1	2	18	..	..	1	19
Grand total	52	21	27	2	3	3	4	112	1	2	5	120

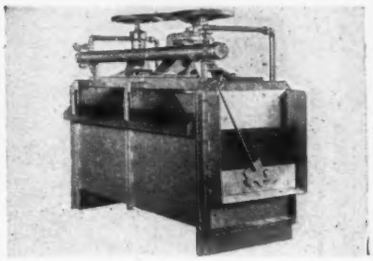
DEATHS AND FATALITY RATES AT U. S. COAL MINES, BY CAUSES OF ACCIDENTS*

January-May, 1942 and 1943

Cause	Bituminous: Number Killed		Bituminous: Killed per Million Tons		Anthracite: Number Killed		Anthracite: Killed per Million Tons		Total: Number Killed		Total: Killed per Million Tons	
	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943
Underground:												
Falls of roof and coal	239	252	1.007	1.007	61	39	2.502	1.494	300	291	1.147	1.053
Haulage	91	99	.383	.396	13	17	.533	.652	104	116	.398	.420
Gas or dust explosions:												
Local	1	13	.004	.052	4	1	.164	.038	5	14	.019	.051
Major	101	96	.426	.384	...	...	....	....	101	96	.386	.348
Explosives	10	14	.042	.056	5	5	.205	.192	15	19	.057	.069
Electricity	12	12	.051	.048	3	...	123	....	15	12	.057	.043
Machinery	15	11	.063	.044	...	1	....	.038	15	12	.057	.043
Shaft	3	5	.013	.020	2	...	.082	....	5	5	.019	.018
Miscellaneous	13	18	.055	.072	7	8	.287	.306	20	26	.076	.094
Stripping or open-cut	11	14	.047	.056	1	3	.041	.115	12	17	.046	.062
Surface	19	26	.080	.104	5	8	.205	.306	24	34	.092	.123
Grand total	515	560	2.171	2.239	101	82	4.142	3.141	616	642	2.354	2.324

* All figures subject to revision.

PREPARATION *calls for* CONSERVATION



The era of salvaging all the values is fast approaching in the coal industry. The present scarcity of fuels underlines the need for strict conservation. The Galigher Company, adhering to its traditional policy of exploring new ways, invites your attention to the AGITAIR Flotation Machine, so admirably adapted to the treatment of fines and recovery of coal values through froth flotation. Discover how the AGITAIR can help you eliminate the nuisance of the culm pile and turn needless waste into a positive asset.

Write for Bulletin 421 and ask for special information on the flotation process in the coal industry.

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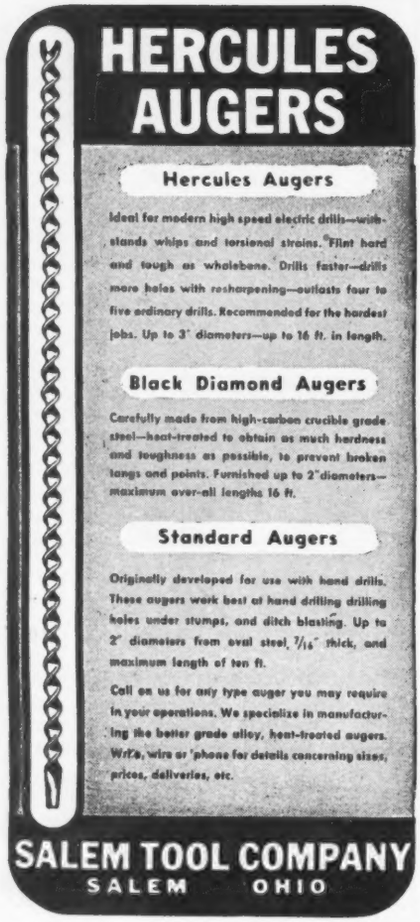
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Ideal for modern high speed electric drills—withstands whips and torsional strains. Flint hard and tough as wholebone. Drills faster—drills more holes with resharpening—outlasts four to five ordinary drills. Recommended for the hardest jobs. Up to 3" diameters—up to 16 ft. in length.
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Call on us for any type auger you may require in your operations. We specialize in manufacturing the better grade alloy, heat-treated augers. Write, wire or 'phone for details concerning sizes, prices, deliveries, etc.
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Personal Notes

H. F. Hebley, for the last four years product control manager in charge of coal quality for the Pittsburgh Coal Co., Pittsburgh, Pa., has been appointed director of research. His duties will be directed toward long-range planning on mining, coal utilization, economics, marketing and improvement of quality. Mr. Hebley received his general and technical education in New Zealand, followed by broad practical engineering experience in the mining of metals and coal in Arizona, Utah and New Mexico. For 16 years he was associated with Allen & Garcia, consulting engineers on coal mining, coal properties, coal utilization and coal-plant design. During this period he spent about two years on the American commission to the coal industry of the U.S.S.R. For four years he was with the Commercial Testing & Engineering Co. working on utilization of coal, power-plant testing and design. More recently he returned to the United States after completing a special mission to the Commonwealth of Australia for the Board of Economic Warfare in the interest of the United Nations' war effort.

L. A. Kelly has been named superintendent of mines of the Brookside-Pratt Mining Co. in Alabama, vice W. A. Bell, who died May 29. Mr. Kelly formerly was superintendent of the Blossburg "E" mine of the company, Blossburg, Ala.

H. F. Hebley

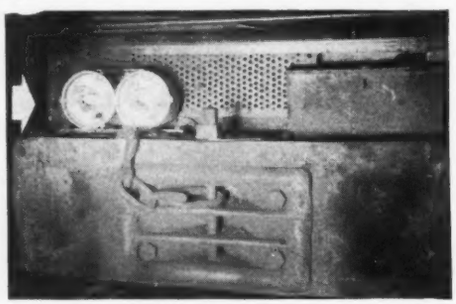
Dr. Corliss R. Kinney, formerly professor of chemistry at the University of Utah, has been appointed professor of fuel technology in the School of Mineral Industries, Pennsylvania State College, State College, Pa. He received his undergraduate training in chemical technology at Iowa State University and did his graduate work in organic chemistry at Harvard, receiving his Ph.D. degree there in 1925. The same year he joined the chemistry department at the University of Utah as an instructor, and was successively advanced to the position of professor of chemistry. While at Utah he published about 30 research papers on various phases of organic chemistry and fuel technology. Dr. Kinney also has done considerable work on the cracking of Utah coal-tar oils and tar acids. He served as a member of the executive committee of the Utah Conservation and Research Foundation, which investigated the low-temperature carbonization of Utah coals. In addition to teaching courses in fuel technology Dr. Kinney will be in charge of the research program at Penn State on the non-fuel uses of bituminous coal.

George McKay has been appointed superintendent of the Blossburg "E" mine of the Brookside-Pratt Mining Co., Blossburg, Ala. He formerly was mine foreman at this operation.

John E. Organ, who has been on the Mining Division staff of the War Production Board since early in 1942 and for the last six months has been handling stripping work in the Coal Section, has resigned from the board to reenter private practice as a geological consultant on coal stripping.

J. M. Sanders, mine foreman for the West Virginia Coal & Coke Corp., Omar, W. Va., has resigned to accept a similar position with the Consolidation Coal Co., Jenkins, Ky., with which Mr. Sanders formerly was connected before going to Omar.

Twinlite
LOCOMOTIVE HEADLIGHTS



Never without light on trips

Automatic switchover to battery power on failure of primary power source assures continuous light for greater safety

There are numerous times during moving trips when the primary power is cut off. It is during such times that the TWINLITE prevents accidents and saves serious damage and costs. No collisions with run-away cars, no accidents due to lack of light while repoling trolley.

In addition to the battery that takes over when primary power is cut off there is another safety feature—should one light burn out it has no effect on the other light.

Flexibility allows for mounting to suit the locomotive type and for separation of lights as desired. The battery is charged directly from trolley. The entire balanced 6-12 volt system is foolproof.

Designed with sealed beam principle.

Get details—let us tell you what users say.

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"The Packing that gets the Repeat Orders"

For deep mine pumps. Resists acid mine waters. Keeps grit out of stuffing box. Three types.

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Best ever devised. Will not freeze at 70° below. Soft, pliant, like fibrous types, yet easier to handle. Won't cut, score or corrode moving parts.

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Metal strands twisted with asbestos. Anti-frictional. Durable. Economical. Remarkable compressability. Never hardens. For temperature up to 550° F.

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Most modern development for all hydraulic applications. A solid-packing vegetable fibre combined with metal strands. Retains form under any conditions.

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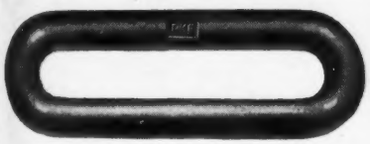

Drop Forged Links

Drop forged for strength, Superior Swivel and Single Link Couplings are built to stand the gaff. No welds to let go with resulting wrecks. Superior Couplings on your mine cars will prevent accidents and reduce haulage costs. Order Superior Couplings for your replacements and specify them on new equipment.

DROP FORGED SWIVEL COUPLINGS

PITTSBURGH
KNIFE & FORGE CO.
716 Chateau Street
N. S., Pittsburgh, Pa.

John L. G. Weysser

JOHN L. G. WEYSSER, deputy chief, Coal Section, Mining Equipment Division, War Production Board, has been appointed chief of the Coal Section. He has been connected with the Division since November, 1941, spending most of his time during the last few months on a special field assignment. Previously he had been assistant professor of mining engineering at the University of Illinois.

ROY WILDER, chief electrician for the South East Coal Co., Seco, Ky., has resigned that position to accept similar work for the Fourseam Coal Corp., Diablock, Ky.

KENNETH O. WOOD, formerly sales manager, Vickers Coal Co., Trinidad, Colo., has been elected president of the company to succeed his father, the late F. R. Wood.

•

Coal Agency Expands Service: J. K. Taggart Joins A.C.I.

J. K. Taggart has been elected vice president and a member of the board of Appalachian Coals, Inc., Cincinnati, Ohio, according to an announcement by R. E. Howe, president. In assuming his new post Mr. Taggart relinquishes the vice chairmanship of the Bituminous Coal Producers' Board for District 8, which goes out of existence Aug. 23 with the expiration of the Guffey Coal Control Act.

Mr. Taggart's entire business life has been with the coal industry as engineer and in the production and distribution field. He went to Cincinnati in 1939 as manager of sales for A.C.I. On Jan. 1, 1941, he became vice chairman for District 8 board. Previously he had been sales manager for Whitney & Kemmerer, New York coal distributor, and vice president and general manager of the Norton Coal Co., Norton, Va.

With the acquisition of Mr. Taggart to the official staff of A.C.I. the activities of the agency will be greatly expanded

IS YOUR COAL *Ready for a Fight?*

There's going to be one—a brisk free-for-all struggle for orders—with no holds barred.

There's no doubt about the winner—Prepared Coal! Coal thoroughly cleaned, accurately sized—coal that the smart buyers want, and will pay a higher price to get.

Make sure right now that your coal will hold its own in that tussle—will get that top price.

You can guarantee your future. You can arrange now for an adequate preparation plant custom-fitted to your particular needs. A survey and plan, drawn up by trained specialists, costs you nothing—not a penny nor an obligation. Ask us about it—and now's the time.

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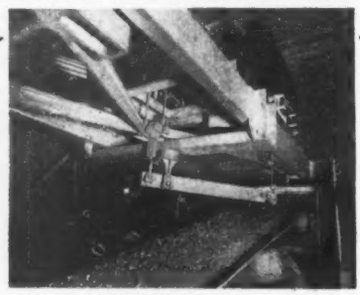

Photo courtesy Marion Station, Jersey City, N. J. of Public Service Electric & Gas Co.

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Toledo Chronoflo

CONVEYOR WEIGH METERS

Dependable equipment for *accurately* weighing and/or blending coal *while in transit* on conveyor belts. Write to Builders-Providence, Inc., 9 Codding St., Providence, R. I., for Bulletin 322.

Sincerely Yours,

BUILDERS-PROVIDENCE

and will include inspection of coal at the mines, improvement in extension and efficient use of solid fuels, additional activity in assisting consumers of both industrial and domestic fuel in selecting the most suitable coal for their use, and assisting all government agencies in obtaining coal needed for war purposes. A.C.I. markets about 35,000,000 tons annually.

•

Sentinels of Safety Awards To Knife River and Stockton

Knife River mine of the Knife River Coal Mining Co., Beulah, N. D., won the "Sentinels of Safety" trophy for 1942 among bituminous mines and Stockton mine of the Jeddo-Highland Coal Co., Stockton, Pa., was the winner in the anthracite division. The latter's record for 1942 showed 194,897 man-hours of work with 20 lost-time accidents and 170 days of disability. The accident severity rate was 0.872 day of employee disability for each million man-hours worked during the year.

Knife River mine employees worked 250,531 man-hours with one lost-time accident that caused 22 days of disability. The severity rate was 0.088. Honorable mention in the bituminous group went to: (2) Irish Rock mine, Irish Rock Coal Co., McConnellsville, Ohio; (3) Hiyasota No. 2 mine, Penn Smokeless Fuel Co., Thomas Mills, Pa.; (4) Parker No. 1 mine, Cumberland Parker Seam Coal Co., Barrelville, Md.; (5) Charitan mine, Charitan River Coal Co., Novinger, Mo.

Annual competition for the "Sentinels of Safety" trophy is sponsored by the U. S. Bureau of Mines and trophies are donated by the *Explosives Engineer* magazine.

•

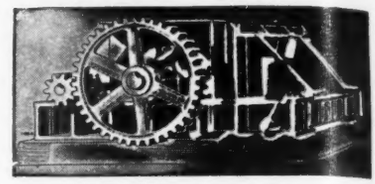
Test for Coal Swelling Index Approved by A. S. T. M.

An important contribution, approved by the American Society for Testing Materials annual meeting, June 28–July 1 in Pittsburgh, Pa., under the auspices of Committee D-5 on Coal and Coke, was the new tentative test for determining the free swelling index of coal, results of which may be used as an indication of the coking characteristics of the coal when burned as a fuel.

This small-scale laboratory test is not designed to determine expansion of coals in coking ovens. However, the committee included in its report six proposed methods of test for determining the basic properties of coals for evaluating expansion and pressure characteristics in coking ovens during carbonization. By publishing the methods the committee hopes to stimulate their greater use so that they can be more adequately evaluated. One of the methods was the subject of a technical paper at the meeting by Messrs. Soth and Russell on "The Gieseler Method for Measurement of the Plastic Properties of Coking Coals."

The committee is including in its widely used Standard Methods of Laboratory Sampling and Analysis of Coal and

A NEW VERSION OF AN OLD TYPE



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With this advanced design, in rugged STEELBUILT construction, far more accurate sizing is possible to meet Code requirements through quick adjustability, in a range from ¾" to 8".

Further—real protection is provided by improved Safety Toggle Equipment, which quickly passes Tramp Iron, and instantly returns Breakerplate to crushing position.

Seven (7) sizes afford a capacity range from 50 to 1000 tons per hour.

Send for Bulletin No. 2006.

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PUT YOUR COAL PREPARATION PROBLEMS UP TO US.

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The fine reputation of Wilmot Hydrotators is founded on a great record of performance for nearly half a century. Wilmot preparation equipment is fully tested, thoroughly dependable — the best known, the most widely used in the Anthracite field.

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A GREAT NAME IN THE COAL INDUSTRY
HYDROTATOR COAL *Preparation* UNITS

Coke (D 271-42) a statement indicating that a limit of 30 days should be set on the time between sampling and analysis of coal if B.t.u. is an important consideration.

The society's Committee D-3 on Gaseous Fuels reported important progress in phases of its work, including substantial agreement on a test for determining heating value of gases with a flow-type calorimeter. The committee hopes to arrange publication of an extensive report covering work by the National Bureau of Standards on eleven specific-gravity instruments for determining specific gravity and density of gaseous fuels.

•

Illinois Spoil Leveling Bill Would Increase Prices

Increases of as much as 40c. per ton in maximum selling prices for Illinois strip-mined coal would result if House Bill No. 527, passed by the Illinois General Assembly early in July, should become law, according to statements by the Illinois Coal Strippers' Association. The bill went July 23 to Governor Green, who has ten days in which to sign or disapprove it.

The bill provides that "it shall be unlawful after July 1, 1943, for any operator to engage in commercial open-cut mining without first obtaining from the Director [of Mine and Minerals] a permit to do so at such time and in such form as it is hereinafter provided."

The bill further provides for leveling spoil piles without delay, as follows: "Such leveling operation shall be done progressively following the opening of each new open cut or strip so that no more than three spoil ridges shall be left unleveled."

Secretary Ickes' help was asked by the Illinois strippers, who declared that compliance would require the purchase of over $3,000,000 worth of equipment, require labor that is not now available, and entail a cost increase of as much as 40c. per ton. Many operators, it was pointed out, were of the opinion that the measure would put them out of business. The measure also was described as unconstitutional and an unwarranted interference with government-operated plants. Ickes was asked to request a gubernatorial veto. The additional cost of production which the bill would entail was estimated at $7,500,000 annually.

•

Hard-Coal Producers Seek Cut in Tax Assessments

Glen Alden Coal Co., Scranton, Pa., seeks a reduction of $15,800,000 on coal assessments in Luzerne County, Pennsylvania. A petition filed July 20 by Edward Griffith, vice president and general manager, and J. H. Oliver, vice president and general counsel of the company, asks that coal lands and buildings of individual operations be assessed as colliery units instead of by multitudinous tracts as at present.

The petition alleges that much of the assessments that it is sought to wipe out covers coal under streets and highways to provide support; coal in built-up sections where mining would cause disintegration of properties on the surface; coal which when acquired was required by deed or otherwise to be left to support the surface; coal which had to be abandoned because of squeezes; and coal which cannot be mined because of mine fires.

The Lehigh Valley Coal Co. asked for a cut of from $1,700,000 to $2,000,000 in assessments on July 21. The companies declare their requests are based on various court decisions, and are believed to be the prelude to many others. The assessors are to set dates for hearings, and if the reductions are rejected the coal companies will take appeals to the county courts.

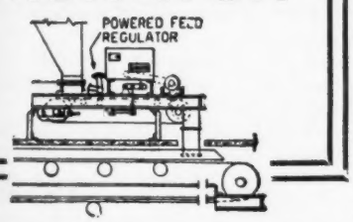
•

Workers' Insurance Rates Revised in Kentucky

A new plan for determining workmen's compensation insurance rates in Kentucky's coal industry was announced July 22 by James R. Milliken, chairman of the State Workmen's Compensation Board, Frankfort, Ky. At the same time he reported a revision of workers' insurance rates for coal mines, based on the new rating plan, which he said will effect a "substantial reduction in insurance costs for mining companies" whose rate of accidents "is rather constant."

Approval of the plan and revision by the State board completed two years' work revising the entire insurance rating structure of the board. Mr. Milliken said, adding

MERRICK



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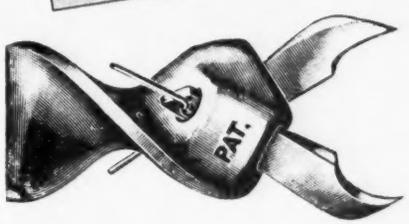
IN DIFFERENT COALS



So, therefore, it is up to the BIT! So long as conditions differ, fast drilling with low costs depend on the bits you use being able to perform regardless of the seam, the impurities, or other characteristics.

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that it was "the first scientific overhauling of insurance rates ever attempted by the board."

The board on May 4 announced an additional 3.9 percent reduction, effective June 30, in the level of workmen's compensation rates for all industries except coal mining. This brought the general industry rate level down to 33.3 percent below the level in effect when the industrial rating system was adopted June 30, 1937, Mr. Milliken said.

The revision of coal industry rates was made effective retroactively to last Jan. 1, the board chairman said.

The plan adopted for the coal industry, he continued, "has been successfully used for industrial classifications for several years and found to be superior to the old plan in many ways.

"The principal improvements of the new plan are simplicity and the fact that more credibility is given to accident frequency and less to accident severity" in determining insurance rates.

"Thus there is more incentive on the part of the mine operator for safety work and accident prevention since his insurance rate will be affected more by accident frequency and less by the element of luck than has heretofore been the case."

Net effect of the coal industry rate revision, Mr. Milliken said, is:

1. Application of ordinary industrial insurance principles to coal-mine insurance.
2. Substantial reduction in insurance costs for mining companies whose accident experience is rather constant and does not vary much from year to year.
3. Emphasizing of accident prevention through safety rules.

•

Tennessee Gas Line Tentatively Approved; New Line Planned

Tentative approval has been given to the Tennessee natural-gas pipeline and an application has been filed for another line by the Hope Natural Gas Co. from the Hugoton field of Kansas to the company's existing facilities in Kanawha County, West Virginia.

In the Tennessee Gas & Transmission Co. case—*Coal Age*, July, 1943, p. 126—the Federal Power Commission stated early in July that it would authorize issuance of a certificate of convenience and necessity to construct a pipeline to supply the West Virginia-Ohio-Pennsylvania region with Louisiana and Texas natural gas if the applicant could present satisfactory evidence of ability to finance the line, obtain adequate supplies of natural gas, and secure authorization from the War Production Board for the required materials. The Commission ordered a hearing to be held beginning Sept. 8 to give the applicant an opportunity to make the required showing.

Governor Jones of Louisiana said July 10 that the Tennessee company would have a fight on its hands in attempting to build the pipeline. "There won't be any gas line constructed by the Tennessee Gas & Transmission Co. while I am Governor of Louisiana," the Governor said. Louisiana opposed the project in hearings before the Power Commission, contending that the State's gas supplies were running low and that the region to be served has adequate power resources in coal deposits in the Appalachian fields.

The Hope Natural Gas Co. filed its application with the Federal Power Commission late in June for a certificate to construct a 22-in. line from the Hugoton field in Kansas to Kanawha County, West Virginia, a distance of 1,140 miles, to bring gas for delivery to the company's existing system and to other natural-gas companies. Estimated cost of the project is $51,000,000.

•

Obituary

D. W. CHRISTIAN, 76, chief electrician, Luzerne-Graham Mining Corp., Greenville, Ky., died July 3. He had been connected with the company since youth.

JAMES F. DALY, president of the Daly-Volpe Coal Co. and one of the leading independent anthracite operators, died suddenly July 18 at his home in Dunmore, Pa.

ALBERT JAMES LAMBERT, 57, night mine foreman for the Buchanan County Coal Corp., Big Rock, Va., died suddenly July 16 following a heart attack. He had been associated with the Big Rock concern for about four months. Previously he had been with the Crystal Rock Coal Co., Roth, Va.

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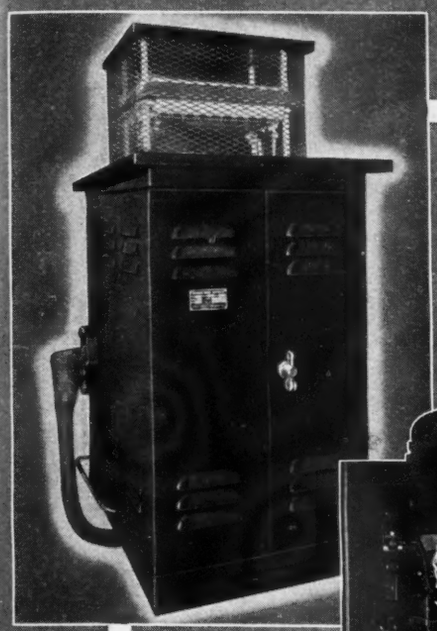

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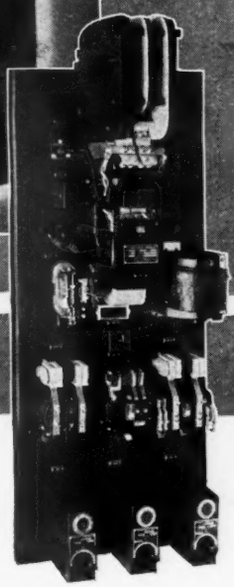

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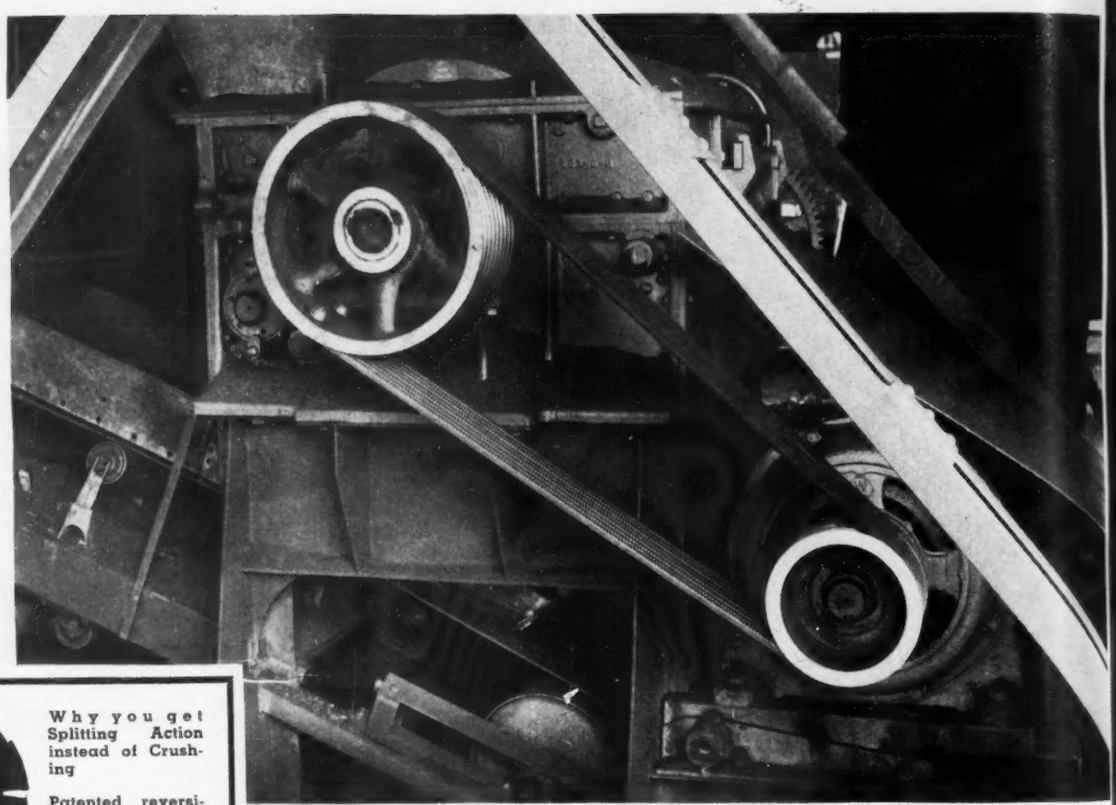

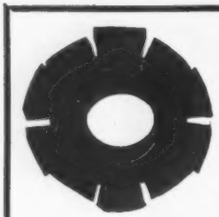

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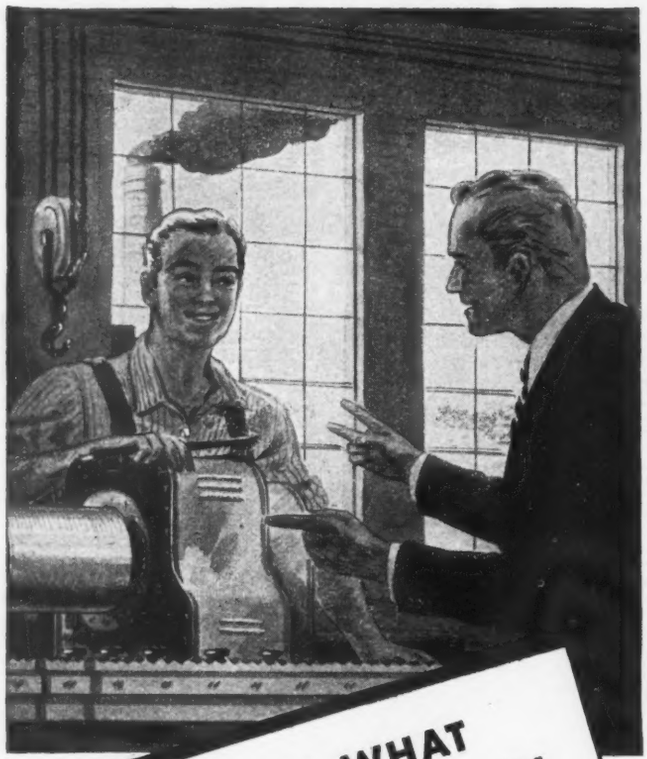

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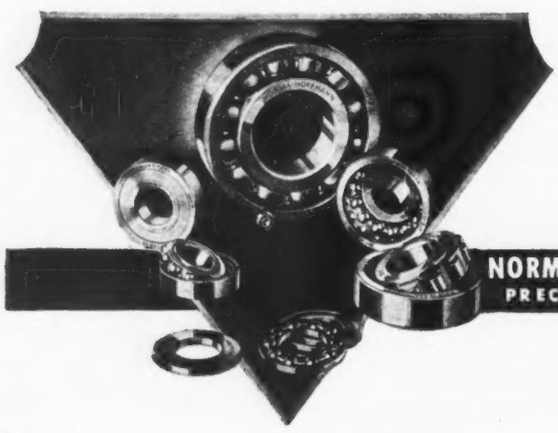

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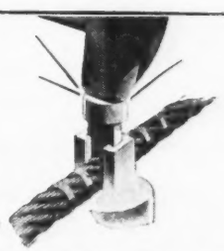

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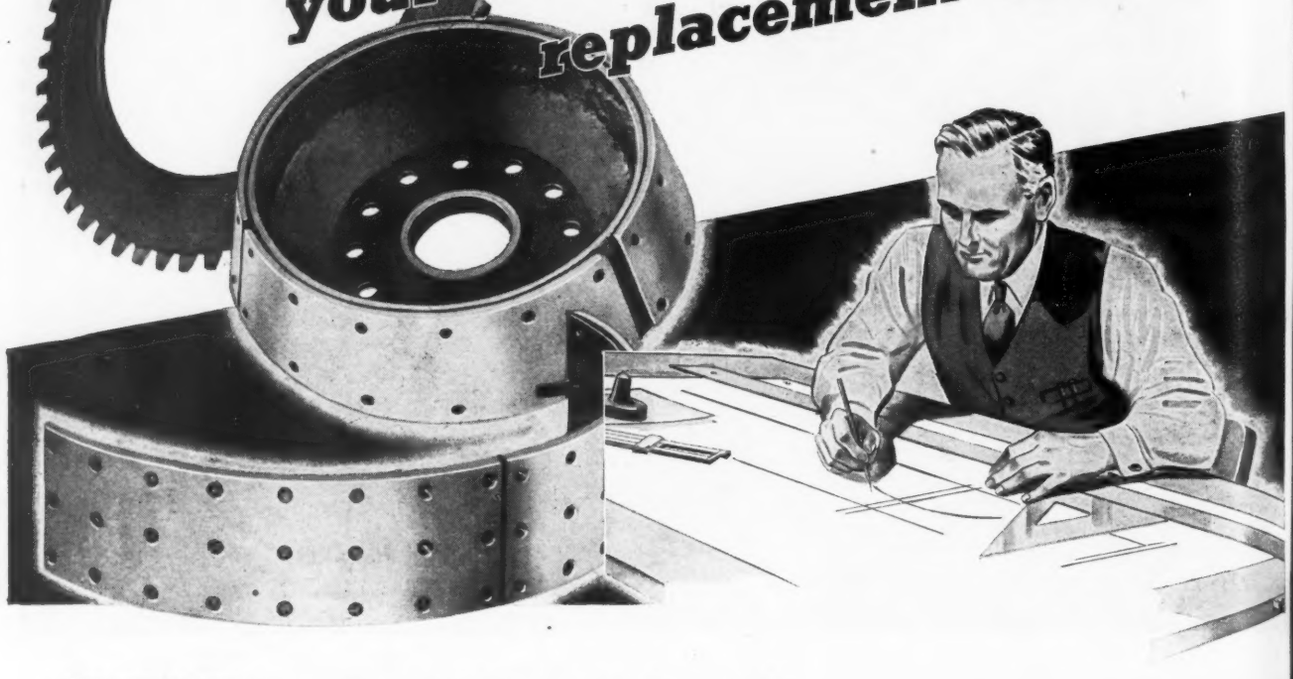

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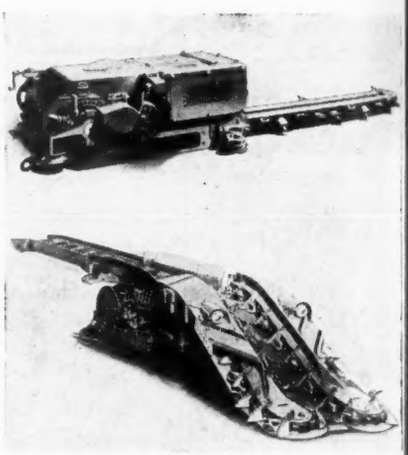

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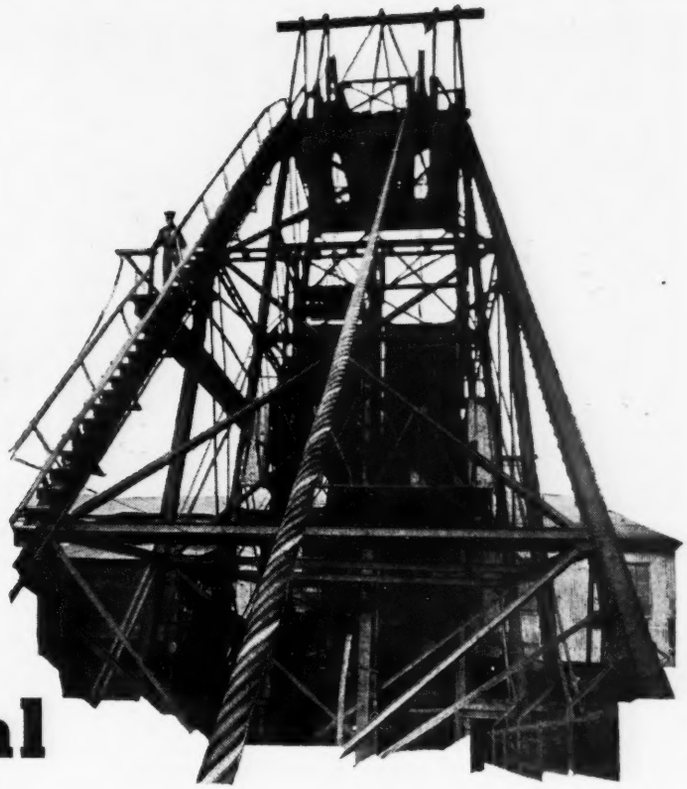

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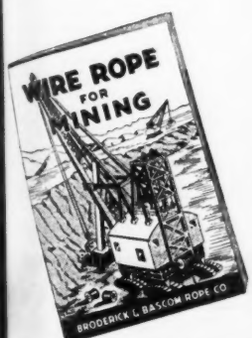

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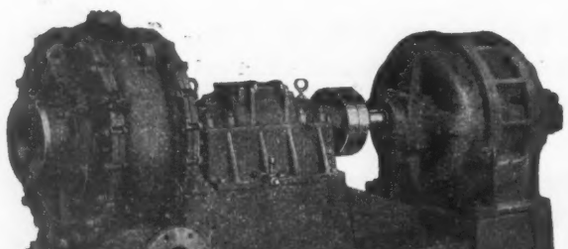

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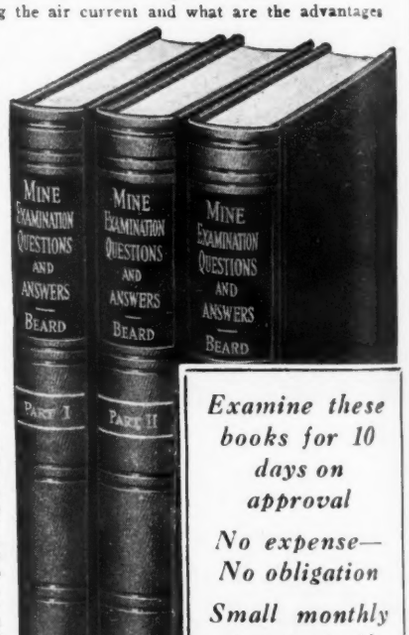

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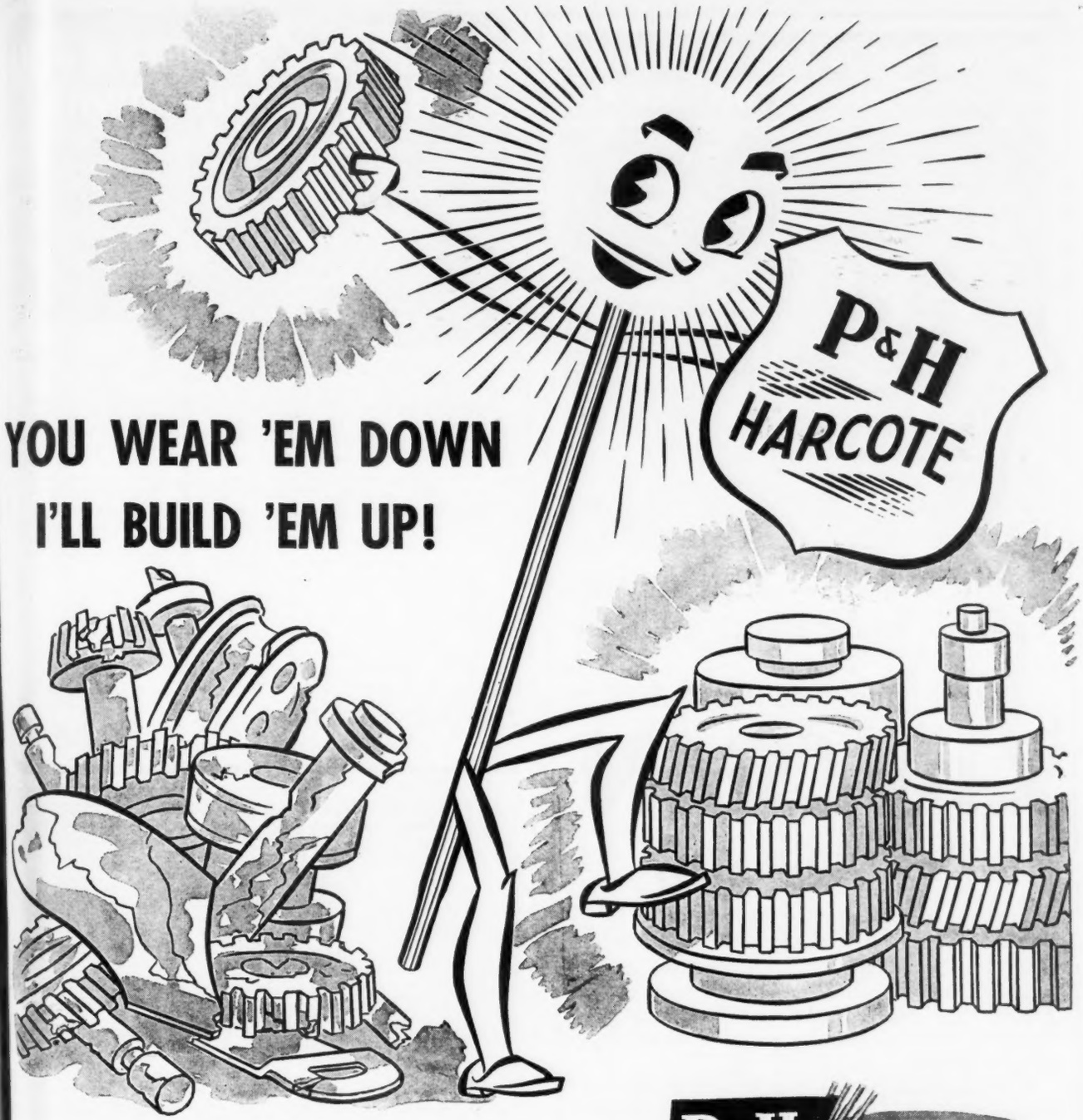

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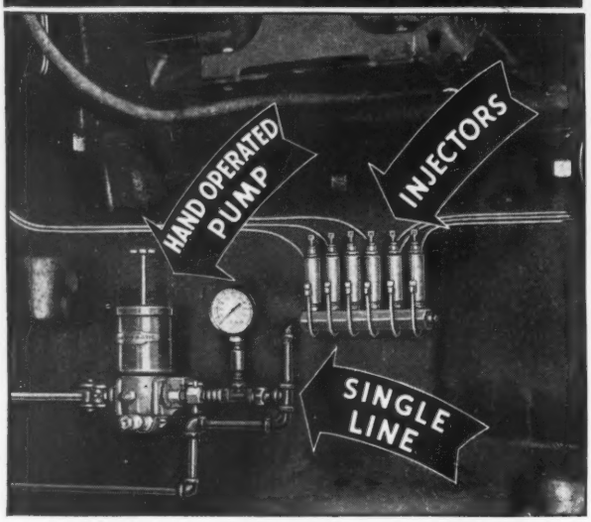

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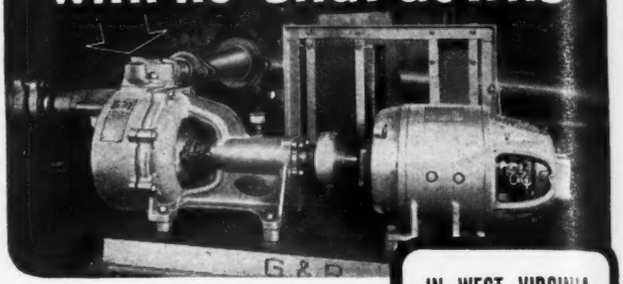

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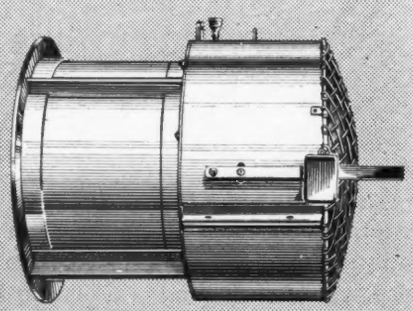

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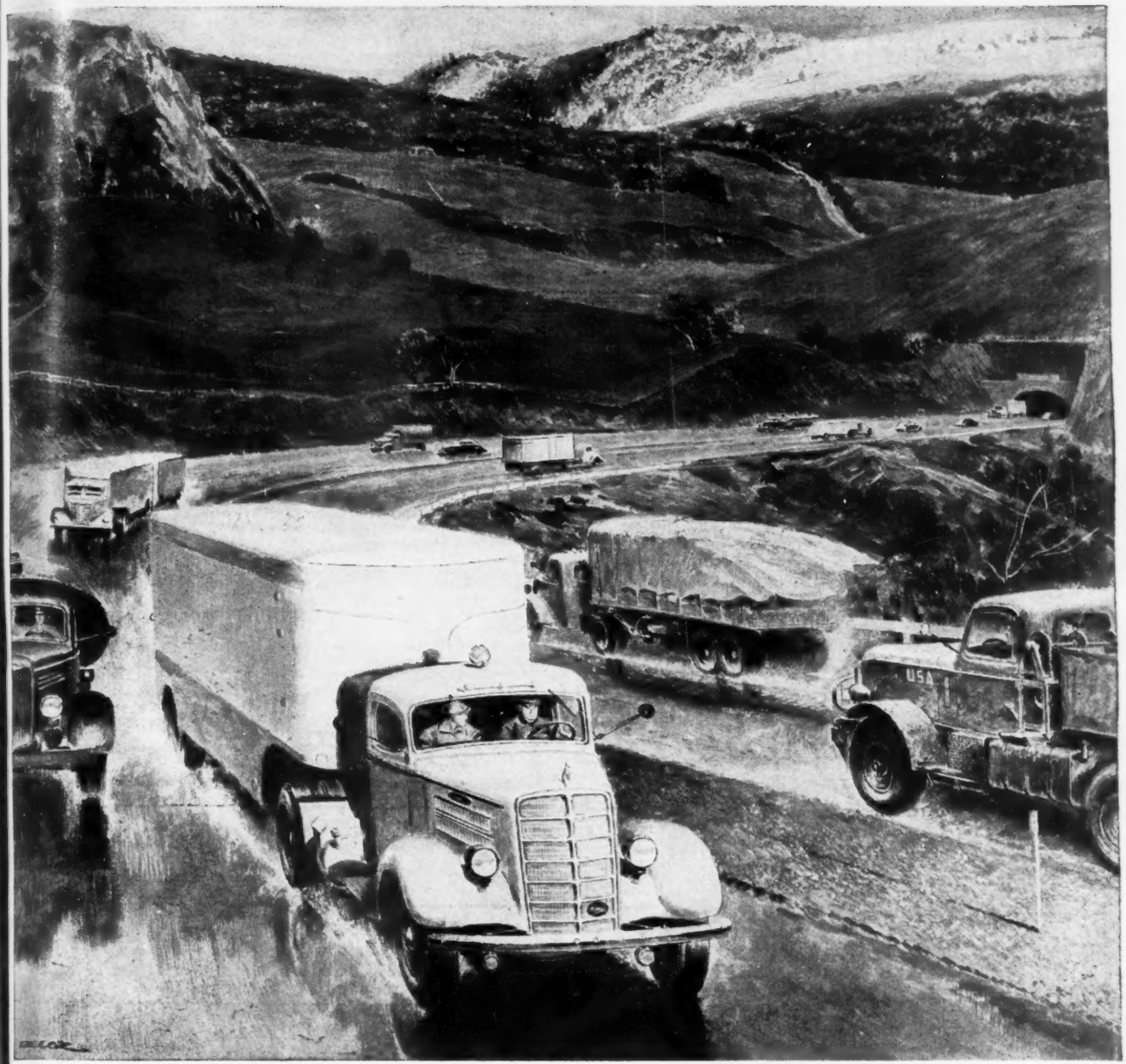

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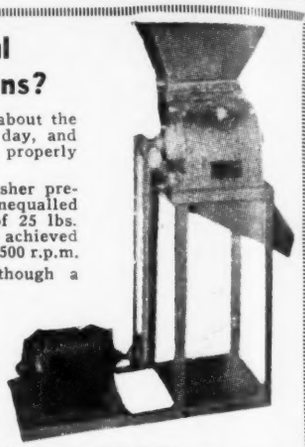

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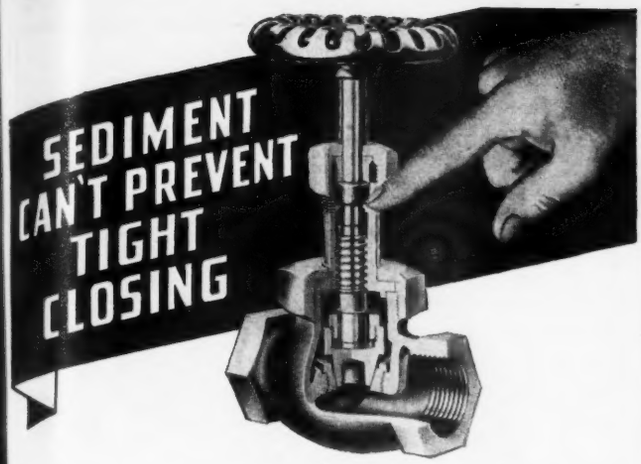

Ever have trouble repacking the stuffing box of a valve because sediment had accumulated in the bonnet chamber? That can't happen with the *top* seat in Fairbanks Plug Valves. A tight seat is always certain because the shoulder on the stem which engages the seat in the bonnet is ABOVE the threads on the stem.

This tight closing feature makes it impossible for scalding steam or hot liquids to escape and burn your hands when repacking the stuffing box under pressure.

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Throughout, you'll find many other instances of the unusual care used in the design and manufacture of Fairbanks Plug Valves.

Write for name of our nearest distributor and Catalog No. 42.

THE FAIRBANKS COMPANY
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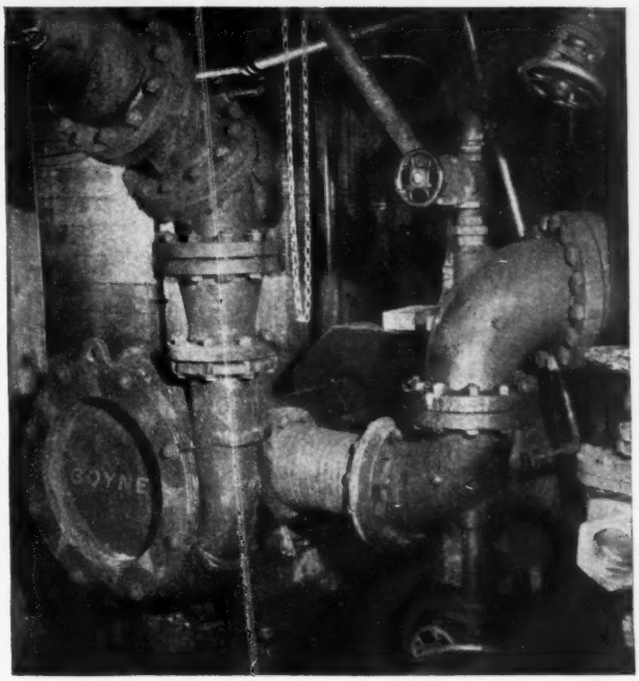
Fairbanks *Standard and* Renewable **Valves**

GOYNE PROCESS PUMPS



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1. Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing only the rear head of the pump. No suction or discharge piping is disturbed.

2. The one packing box of the pump is subjected only to suction pressure and is readily kept clean by a low pressure clear water line. Long packing and shaft sleeve life is assured.

3. Impeller clearance is adjusted *while the pump is running*, insuring constant pump capacity so essential for uniform washing.

4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.

5. We carry the spare parts stock. Order your replacements when needed. Reduce your inventory by using Goyne Process Pumps.

All inquiries receive prompt and careful attention.

THE GOYNE STEAM PUMP CO.
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THOUSANDS of men in industrial plants, mines and mills all over the country are doing just what this man is doing. They are cutting costs by repairing conveyor belts with Flexco HD Rip Plates.

WRITE TODAY FOR BULLETIN F-100 that shows how easy it is to repair rips, to strengthen soft spots and to put in patches by using Flexco HD rip plates. The bulletin also shows how to make tight butt joints in both conveyor and elevator belts with Flexco HD Belt Fasteners. These fasteners are made in six sizes. Furnished in special analysis steel for general use and in various alloys to meet special conditions.

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Flexco HD Belt Fastener

FLEXIBLE STEEL LACING CO.
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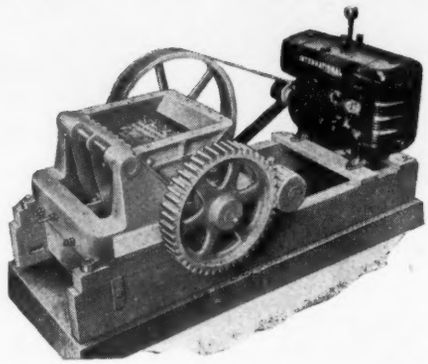
FLEXCO HD BELT FASTENERS
Sold by supply houses everywhere

McLANAHAN FAST
"Bantam Buster" COAL CRUSHER



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Illustrated is the low-cost powerful, McLanahan "Bantam Buster" with International Engine power drive—a definite production need for the small coal mine operator. Engine, of course, is optional.

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Any perforation

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The improved flexible tubing for mine and tunnel ventilation

This flexible air tubing is ready for immediate, easy installation. With our NEW ROPE SEAM SUSPENSION it can be put up or taken down in a fractional part of the time required by other means of face ventilation.

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3—10-ton General Electric, HM-809, 250 volt ball bearing motors.
3—10-ton Goodman, 34-B, 250 volt ball bearing motors.
3—10-ton Westinghouse, 907-C, 250 volt ball bearing motors.
2—8-ton Goodman, 132-A-O-4-C, 250 volt ball bearing motors.
3—8-ton General Electric, HM-819, 250 volt ball bearing motors.
3—6-ton Goodman Gathering, 33-I-4-T-2, 250 volt ball bearing motors.
7—6-ton General Electric Gathering, HM-823, 250 volt ball bearing motors.
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THE ABOVE LOCOMOTIVES ARE FROM 36" TO 48" GAUGE, COMPLETELY REBUILT AND GUARANTEED

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7—5-BU, JOY, 250 volt DC.
5—Jeffrey, L-400, 250 volt DC.
4—new Jeffrey, 44-L, 250 volt DC.

SHORTWALL MINING MACHINES

5—Goodman, 112 CC, 250 volt.
6—Sullivan, CE-7, 220/440 volt AC.

MINE CARS

400—3-ton, 44" gauge, end dump mine cars, 16" Timken Roller Bearing Wheels, height overall 36".

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1—800 H.P. Allis-Chalmers, single drum, slope hoist, 7000' of 1¼" rope, 3000# rope pull, rope speed 870 FPM, 2300 volt.
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1—1300 H.P. Shaft Hoist with cylindro-conical drum, 1675' of 1¾" rope, 2300 volt.
1—1300 H.P. double drum cylindro-conical drum, 900' of 1¼" rope, 2300 volt.

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MODERN COAL TIPPLE—for strip or deep mine
makes seven sizes and includes:
Railroad Tracks, Headframe, Dump Hopper, Feeder, Main Shakers, Five Picking Table-Loading Booms, Remixing Conveyor, Refuse Conveyor, Crusher above Main Screens, Dry Cleaning and Stoker Sizing Section, Car Retarders, Steel Structure, Motors, Lighting System, etc. *Will consider Investing with the right people*
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TRANSFORMERS WANTED

in operating condition or burnt out. Mail us list giving complete nameplate data and stating condition.

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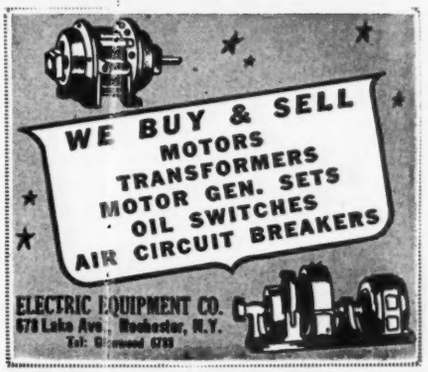

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Cap. 6000#, 30" Track Ga., Lgth. 9'4", Width 52", Ht. overall 42"
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"Anything containing IRON or STEEL"

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1—12 G3 Goodman 220/3/60 AC 6' Bar.
3—12 AB Goodman 250 V. DC. 6' Bar.
1—35 B. Jeffrey 250 V. 6' Bar Bowdill #11416, with cables.
212 G3 Goodman AC Low Vein 6' bar 6185.

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4 General Electric 6 Ton Permissible Type LSBE Class 2C6 Form C 9 with 2 HM 825 Ball Bearing Motors. 1¼" armorplate frame, 44" Ga. (Can change to 36" ga. or less.) Each locomotive equipped with an Exide Ironclad Battery 54 cell 23 plate with 12 months of original guarantee also 1 charging Panel with each locomotive. 131½" long, 50" high, 69" wide and 44" Wheel Base. Available for inspection at our Oakdale Shop.
5 Ton Ironton locomotive, Type E2, 36" Ga. with Gould Battery 23 plate with 12 months of original guarantee.
4 Ton Jeffrey 44" Ga. with Battery.

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2—4' x 5' single deck Tyler Hummer Screens Type 37 equipped with V-16 Vibrators No. 2860 and 2867 designed for 110 v. AC 15 cy.

(Haulage)

10 Ton Westgh. 250 V. 36" or 40" Ga.
8 Ton Westgh. 250 V. 42" Ga.
2—5 Ton West. 250 V. 36 or 42" Ga./with Electric Gathering Reels. Bar steel frame.

MG SETS 3 ph. 60 cy. (Syn.)

150 KW Ridgway 250 V. DC 2200 V. AC 900 RPM.
150 KW West. 550 V. DC 2200 V. AC 900 RPM.
65 KW G.E. 250 V. DC—2200 V. AC 1200 RPM.
30 KW West. 250 V. DC—220 V. AC 1150 RPM.
22½ KW Al. Ch. 125 V. DC—2200 V. AC 900 RPM.

ROTARY CONVERTERS

1—500 KW HCB Gen'l Elec. 275 v. with switchboards and Trans. 6600 or 3800 v. 3 ph. 60 cy.

ENGINE GENERATOR SETS

100 KW 250 v. DC Westgh—Skinner Engine.
50 KW West. 125 v. DC—Skinner Engine.
25 KW Westinghouse 125 v. Steam Turbine.

SYN. MOTORS 3 ph. 60 cy.

HP	Make	V.	Speed
75 (1)	G.E.	2200	900

SLIP RING & SQ. CG MOTORS (3 ph. 60 cy.)

HP	Make	Speed	Wdg.	Type
700	G.E.	393	S.R.	MT 432
400	West.	500	S.C.	Cs.
300	G.E.	600	S.R.	IM
200	G.E.	250	S.R.	MT 412
150	G.E.	720	S.R.	IM
150	G.E.	600	S.R.	IM
125	Al. Ch.	435	S.R.	
100	G.E.	500	S.R.	MI-25 cy.

HIGH TORQUE WOUND ROTOR MOTORS (Wound Rotors)

HP	Make	V	Speed
200 (4)	G.E.	2200	600
150 (3)	G.E.	2200	600

HOISTS

75 HP Lidgerwood sgl. fr. drum
50 HP Diamond 2 drums same Shaft
52 HP American 2 drum, AC Motor
30 HP Clyde sgl. drum AC Motor
30 HP Double drum—Tandem
15 HP Lidgerwood sgl. dr. AC Motor

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Qu.	KVA	Pri. V.	Sec. V.
3	1	2080/2200	115/230
5	2	"	"
100	5	"	"
82	7½	"	"
71	10	"	"
2	25	2200	244/488
1	30	2080/2200	115/230
3	37 Rotary	4400/185	"
3	50	22000	2200
3	75	2200	110/220
1	100	2300	230/460
3	100 Uptegraff	400	220
1	150	3 Phase	230/460

D. C. MOTORS

200 HP Allis Chalmers 230 V. 600 RPM.
125 HP General Electric 230 V. 750 RPM.

MOORHEAD-REITMEYER CO., INC.

PITTSBURGH, PENNSYLVANIA

COAL CUTTING MACHINES

3—35B Jeffrey 250 V Shortwalls.
2—35B Jeffrey 500 V Shortwalls.
1—35BB Jeffrey 250 V Permissible Shortwall.
1—35BB Jeffrey 500 V Permissible Shortwall.
1—29LE Jeffrey T.O.H. Arcwall 250 V Permissible.
1—12AB Goodman 250 V Shortwall.
2—12A Goodman 500 V Shortwalls.
1—112EJ Goodman Permissible Shortwall 250 V.
1—12G3 Goodman AC Shortwall 3/60/220-440 V.

LOCOMOTIVES

All Steel Frames

1—13 Ton G. E. with HM-829 250 V Motors.
1—10 Ton G. E. with HM-830 250 V Motors.
1— 8 Ton G. E. with HM-839 250 V Motors. and reel.
2— 6 Ton Jeffrey with MH-88 250 V Motors and reels.
1— 6 Ton G. E. with HM-819 250 V Motors.

ELECTRIC MOTORS

1—165 HP G. E. Syn. Motor, 3/60/2200 or 500 V, 900 RPM.
1—100 HP Crocker Wheeler Syn. Motor, 3/60/220 V, 1200 RPM.
2—50 HP G. E. Slip Ring Motors, 3/60/440 V, 600 RPM.
1—100 KW West. Type SK, 275 V, 900 RPM DC Generator.
1—100 HP West. Type CW Slip Ring Hoist Motor 3/60/2200 V. 720 RPM.
3—150 KVA Pittsburgh Transformers, 6600-220/440 V.
2—37½ KVA Pittsburgh Transformers, 2200-220/440 V.
3—100 KVA G. E. Transformers, 6600-2200-220/440 V.
1—25 HP West. Type HK, 250 V Series Wound Hoist Motor, 600 RPM.

Tippins Machinery Company

3530 Forbes St. Pittsburgh, Pa.

MINING MACHINES

Goodman Standard & Universal.
AC & DC Rebuilt & Guaranteed

MINE LOCOMOTIVES

5 to 20 ton.

STRIPPING SHOVELS

M. G. SETS & ROTARY CONVERTERS

PUMPS and FANS

COAL CRUSHERS

Coal hopper with weigh pan and scale
Hydraulic Wheel Presses

Will buy, sell or exchange.
What do you need?

The Industrial Equipment Corp.

Warehouse: Carnegie, Pa.
P. O. Box 1647 Pittsburgh, Pa.

LOCOMOTIVES

1—American 41 ton, 4 wheel, saddle tank, Locomotive, electric lights, steam brakes, ASME Boiler, 190 lbs. Sale or rent.
1—American 68 ton, 6 wheel, Switcher with tender, electric lights, air brakes, power reverse, overhauled.
2—Vulcan 20 ton, 4 wheel, saddle tank, standard gauge, air brakes, ASME code boiler.
1—Vulcan 14 ton, 4 wheel, saddle tank, 36" gauge, cylinders 9 x 14, ASME boiler.

COAL CRUSHER

1—Jeffrey 24 x 24 single roll Coal Crusher. New condition.

BELT CONVEYOR

1—36" x 740 ft. roller bearing idlers, complete with electric motor and belt, in new condition.

LOG WASHER

1—Allis Chalmers 25 ft., heavy duty, Hutch type, Log Washer, with steel tank, ⅜" plate, with two logs with paddles, 35" diameter.

A. J. O'NEILL

Lansdowne Theatre Bldg. Lansdowne, Pa.
Philadelphia Phone: Madison 8300

TOP GRADE TRACK MATERIALS

RAILS

8700 feet 100 lb. ARA-A
9700 feet 90 lb. ARA-B
9700 feet 90 lb. ASCE
23500 feet 70 lb. PS #97
25000 feet 58¼ lb PS #63
8000 feet 56 lb.

Joint bars to match Tie Plates, Frogs, Switches, etc.

E. C. SHERWOOD

50 Church Street New York
Established 1911

M.G. Sets

2—300 KW 600 Volt Synchronous Motor Generator Sets 2200 Volt AC.

JONES MINING EQUIPMENT CO.

541 Wood St. Pittsburgh, Pa.

TRACTORS AND BULLDOZERS

For Immediate Delivery

Rebuilt "35" size $1850; "55" size $1850. Complete with hydraulically controlled angledozers and self starters. Other tractors, various makes, with and without winches, priced from $495 to $1500.

O. C. EVANS, Mt. Sterling, Ky.

RAILS—CARS

All sections of rails and good serviceable second hand cars, all gauges, also spikes, bolts, frogs, switches and ties.

M. K. FRANK

480 Lexington Ave. New York City
450 Fourth Ave. Pittsburgh, Pa.

RAILS and ACCESSORIES

RELAYING RAILS—Super-quality machine-reconditioned—not ordinary Relayers.
NEW RAILS, Angle and Splice Bars, Bolts, Nuts, Spikes, Frogs, Switches, Tie Plates, and all other Track Accessories.

Phone, Write or Wire

L. B. FOSTER COMPANY, Inc.
PITTSBURGH NEW YORK CHICAGO

FOR SALE

1 Steel Tipple

Ottumwa Iron Works Hoist #3437 complete with General Electric 150 HP Motor 440 Volts 3 Phase 60 Cycles 600 RPM. General Electric Generator Set Type MP, AMP 696 Speed 425, Volts: no load 250—full load 275 equipped with Westinghouse Motor Type CS 200 HP 440 Volts 3 Phase 60 Cycles complete with Switch Board Panels. Goodman 5 Ton Haulage Motor—22 inch gauge. Can be made wider.

All in first class condition.
No agent. Direct Sale.

FS-222, Coal Age
520 N. Michigan Ave., Chicago 11, Ill.

FOR
IMMEDIATE DELIVERY
OF
RUBBER PRODUCTS

Conveyor Belting...Transmission Belting...Elevator Belting...Fire, Water, Air, Steam, Suction or Welding Hose, etc.

CALL, WIRE or WRITE
CARLYLE
THE
RUBBER HEADQUARTERS

CARLYLE RUBBER PRODUCTS ARE NEW, GUARANTEED & LOW PRICED

CONVEYOR BELTING

ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers	Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"	20"	5	1/8"	1/32"
42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
24"	4	1/8"	1/32"				

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

Inquire For Prices - Mention Size and Lengths

ENDLESS "V" BELTS

"A" WIDTH All Sizes | "D" WIDTH All Sizes
"B" WIDTH All Sizes | "E" WIDTH All Sizes
"C" WIDTH All Sizes | Sold in Matched Sets

Inquire For Prices - Mention Size and Lengths

PROTECT THAT PLANT
FIRE HOSE

APPROVED SPECIFICATION HOSE
EACH LENGTH WITH COUPLINGS ATTACHED

Size	Length	Per Length
2½"	50 feet	$28.00
	25 "	16.00
2"	50 "	23.00
	25 "	13.00
1½"	50 "	20.00
	25 "	11.00

Specify Thread On Couplings

SPECIAL OFFER . . . HEAVY DUTY
RUBBER HOSE

WATER HOSE
Each Length with Couplings Attached

I.D. Size	Length	per Length
¾"	25 feet	$4.25
1"	50 "	8.00
	25 "	6.25
1¼"	50 "	12.00
	25 "	7.50
	35 "	10.50
	40 "	12.00
1½"	50 "	15.00
	25 "	10.00
	35 "	14.00
	50 "	20.00

AIR HOSE

I.D. Size	Length	per Length	Couplings
½"	25 feet	$5.00	$1.50 Pair
	50 "	10.00	1.50 "
¾"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1"	25 "	10.00	3.50 "
	50 "	20.00	3.50 "

LARGER SIZES ALSO AVAILABLE
All Prices—Net—F.O.B. New York

CARLYLE RUBBER CO., INC.
62-66 PARK PLACE — NEW YORK, N. Y.

6 YD. or 8 YD. STRIPPER SHOVEL
225B Bucyrus 80 ft. Boom, 54 ft. Dipper Stick, Steam Shovel.

2-4 Yds. SHOVELS
2 Marion Model, 125, Electric, 35' Boom, 25' Dipper Sticks

DIESEL DRAGLINE
3W 4W & 5W Monigham Walkers, 90 to 110 ft booms.
3 Yd. P.&H. 800, 97' boom.
2½ Yd. 48B Bucyrus 80' boom.
2—2½ Marion Electric Shovels.
75—1½ & 2 Yd. Dump Cars.

AIR COMPRESSORS:
(7) Steam 56 ft., 300 ft., 600, 1000 & 1940 ft.
(12") Belted, 360, 676, 870, 10000, 1300 ft.
(12) Diesel 105, 315, 520, 676 & 1000 ft.
(6) Electric, 1300, 1500, 2200, 2600, 5000 ft.
(14) Gasoline, 110, 160, 220, 310 & 370 ft.

COAL CRUSHERS:
Jeffrey Single Roll 18x18, 24x24 & 30x30
Link Belt 24x24 Double Roll Crusher

HYDRAULIC CARWHEEL PRESSES:
100 Ton, 150 Ton, 300 Ton, 300 & 400 Ton Caldwell - Niles - Wood - Watson Stillman

RUBBER CONVEYOR BELTS:
1000' 60", 600' 30", 300' 20", 1600' 42", 900' 48", 1450' 36", 1200' 24", 900' 18", 600' 16", 350' 14".

TANKS:
12,000 and 15,000 gal.

CONVEYOR PARTS:
Idlers, Heads & Tail Pulleys, Steel Frames, Tripper, etc., 14 In., 60 In. Large stock here.

SYNC. MOTOR GENERATORS & ROTARYS:
100 KW Ridgway 1200 RPM 3/60/2300/250-275
150 KW G.E. 1200 RPM 3/60/2200-250-275
200 KW Ridgway 900 RPM 3/60/2200-250-275
3—100 KW G.E. 275 v. 1200 RPM Rotarys

STORAGE BATTERY LOCOMOTIVES:
2½ ton Witcomb 24 ga. New Batteries
2—4 ton G.E. 30 in. ga.
3—5 ton Mancha 30 in. ga.
4—5 ton G.E. 36 in. ga.
3—7 ton Goodman 36 ga. Battery & Trolley
8—6 ton Baldwin Westgh. 42 ga. & 36 ga.

TROLLEY LOCOMOTIVES:
2½ ton Westinghouse 24 ga.
4—6 ton & 3-5 ton Goodman, 36 ga.
3—6 ton Goodman 30 ga.
4—6 ton Goodman 42 ga.
5—6 ton Westinghouse 42 ga.
2—8 ton Goodman 36 ga.
10 ton Goodman 42 ga. & 13 ton Jeffrey

VIBRATING SCREENS:
9 Tyler Hummer 3x6, 4x5, 4x8 & 4x10
2 Robins Gyrex 4x8½
4x12 Niagara, 3x8 L. B., 5x6 Simplex

CARS:
60—Western 26-20-30 yd. Side Dump

SHOVELS, CRANES & DRAGLINES:
3 W 90' Boom, 6 & 160' Boom, Model 6150, 175' Boom, Diesel, Monighan Walkers
1 yd. K 30 Link Belt 50' Boom Crane
2 yd. Page 70' Boom Diesel Dragline
1¾ yd. Marion 450 Elec. Shovel
1¼ yd. Lima Diesel Shovel & Dragline
2 yd. Link Belt Elec. Shovel & Dragline
25 ton Browning 50' Boom Loco. Crane

MINE LOADERS:
Junior Joy 36 ga. Low Pan
Conway 20 Mucker
3—5 BU & 7 BU 36 or 42 ga. Joy
9—Goodman 200 & Jeffrey 441
7 Conway 26A, 30A, 50A, 60 & 75 Muckers

MISCELLANEOUS:
5'x160' Traylor Rotary Dryer
6—Goodman 12CA & 12DA 6 ft. Cutters
9x8 Sullivan Mine Compressors
Clamshell Buckets ¾, 1, 1½ & 2 yd. Cap.
30 ton & 12 ton Vulcan Std. Ga. Gas. Loco.

WANTED TO BUY:
Complete Mines—M.G. Sets, Locomotives, Compressors, Conveyors, Cranes, Crushers & Rotary Converters. Also Rails, Screens, Pumps, Cars, Mine Loaders & Mining Machines.

Tidewater Equip. & Machy. Corp.
305 Madison Ave. New York, N. Y.

★ MINING EQUIPMENT READY FOR DELIVERY ★

CUTTING MACHINES
4—28-A Jeffrey, 250 volt
2—12-A Goodman, 250 volt
1—12-AA Goodman, 250 volt
1—35-BB Jeffrey, 250 volt
1—29-B Jeffrey, 250 volt
2—CE-7 Sullivans, 250 volt
A. C. Motors for Goodman standard and low vein machines

LOCOMOTIVES
10-Ton Jeffrey, 250 volt
8-Ton Westinghouse, 250 volt
5-Ton Westinghouse, 250 volt
6-Ton Ironton, 250 volt, low vein
6-Ton Goodman, 250 volt, 30-B

MISCELLANEOUS
100-KW Ridgway M-G set, 250 volt
24 x 24" Jeffrey coal crusher
2—Cameron Cent. pumps, 650 GPM, 74' head
1—Deming Cent. pump, 400 GPM, 70' head
3—100-KVA G.E. Transformers, 2200 to 220-440 volt
1—100-HP. Natural Gas engine with 220 volt A.C. Gen. A. C. and D.C. motors, controllers, compensators.

Many other items in stock. Let us know your needs—We buy, sell and trade.

ALL-STATE EQUIPMENT CO., INC.
LOGAN, W. Va. PHONE 884

REBUILT—GUARANTEED

1—200 KW. G.E. Rotary Converter.
3—55 KVA. G.E. Rotary Transformers.
3—165 KVA. G.E. Rotary Transformers.
3—Oxide Film Lightning Arrestors.
Motors: A.C. and D.C. in stock.
1—I/R Portable Air Compressor.
Power & Distribution Transformers.
Meters: 5 Ampere, 110 Volt, 2-wire.
Automatic G.E. Brush Raising Device.

R. H. BENNEY EQUIPMENT CO.
Norwood, Ohio

SEARCHLIGHT SECTION

LOCOMOTIVES

Goodman: All 250 volts.
1—10 ton, 21-1-4-T.
1— 6 ton, 30B, 48" 1—5 ton.
1— 5 ton, W-1-2, 36".
1— 4 ton, S-30.

Westinghouse: All 250 volt.
1—4 ton, 903, 48" 1—18 ton, 102, 42"
1—904 c. 44" 500 volt. Also 906 motors.
1—10 ton, 915.

G.E.: All 250 volt.
6 ton 803, 44", as is
6 ton 823, 44"
6 ton 801
8 ton 822
4 ton 1022, 41, as is
5 ton 825, 44"
8 ton 839 motors

Jeffrey: 6 ton, and 4 ton, all gauges, 250 volt
2—Jeffrey MH 110 Locomotives
1—Jeffrey MH 100

MINING MACHINES

Jeffrey, 35B, 29B, and 4—28A, 250 V. 2—29C with drop bar support.
Goodman, 12A, 12AB, 12AA, 12G3A, 34B.
1—12G3 250 volt and 2—112 DA, 500 volt.
2—Permissible Type 12CA. 6—112AA,
1—124AA.
Sullivan, CE7, CE9, CE10, CR10 Low Vein.

SUBSTATIONS—275 volts, D. C.

2—200 KW **GE Rotaries** (600 volt)
1—200 KW **Ridgeway** M.G. Set.
1—200 KW **G.E.** Rotary Converter.
1—200 KW **West.** Rotary.
1—150 KW **West.** Rotary.
1—200 KW. 1—100 K **Ridgeway** M-G Sets.
1—150 KW **Ridgeway** Rotary.
1—150 KW **West.** Rotary converter.
1—100 KW **West.** M-G Sets.
1— 90 KW **G.E.** Rotary.

SPARE ARMATURES

Jeffrey MH 110, MH 78, MH 73, MH 88, 29B, 35B and 28A. **Goodman** 34B, 30B, 30C, 12A 12AB, 12AA, 33-1-4-T, 31-1-4-T. **G. E.** 801, 803, 819, 821, 825, 839. **Westinghouse** 904, 906, 102, 907, YR2, 115. Also 200 KW **Westinghouse Rotary Converter Armature,** 250 V. Bracket Type, 150 KW G. E. HCC Bracket Type, and 150 KW G. E. TC Pedestal Type.

AERIAL TRAMWAYS * HOISTS * PUMPS * MOTORS * TRANSFORMERS * BOND WELDERS * RESISTANCE * COMPRESSORS * DUMPS * SPEED REDUCERS FIELD FRAMES * ARMATURES * GOODMAN HYDRAULIC SHOVELS * MOTOR STARTERS AND CONTROLLERS—AC & DC * DROP BAR SUPPORTS (Gooseneck), 29B and 29C * MINING MACHINE TRUCKS * SWITCHBOARDS * CIRCUIT BREAKERS—AC & DC * CONVEYOR HOISTS * COAL CRUSHERS (double roll) 12"x16", single roll 24"x36" 30"x30" 24"x24" and 18"x16" * Diamond BIT SHARPENER * TURBO-GENERATOR 500 K.W. 275 volt DC * ROPE & BUTTON CONVEYOR 400' long LATHES, SHAPERS * LINK BELT * ELECTRIC SLATE DUMP * SWITCHES * AUTOMATIC CIRCUIT BREAKERS 250 volt 600 amps to 2000 amps * MANUAL CIRCUIT BREAKERS 600 amps to 3000 amps * HOISTS, overhead, AC, 3-60-440, 1 ton and 2 ton * CAR RETARDERS, Fairmont 85# and 100#, STEAM POWER PLANT, 2 Boilers, 2 turbo-generators, 2300 volt, 1 Clam shell bucket 1¾ cubic yard, 1—Figure 8 drum. Coal Crushers—18x16—24x24—36x36. MINE CARS Solid. 22" high with rotary dump.

GUYAN MACHINERY COMPANY, Logan, W. Va.

MINE HOISTS

1—Ottumwa 18" Band friction will coil 2000 ft. ¾" rope 35 or 50 HP motor.
1—Vulcan 30" Band friction will coil 3000 ¾" rope 50 or 60 HP motor.
1—Lidgerwood 36" friction drum will coil 2000 ft. ⅞". 100 HP motor.
1—Connellsville 54" Band friction will coil 5000 ft. ⅞" rope 100 or 150 HP motor.
1—Flory-Keyed drum 58' dia. with 100 or 150 HP motor.
1—Lidgerwood 60" Band friction will coil 6500 ft. 1⅛" rope with 200 to 350 HP motor.
1—Vulcan 72" Band friction will coil 2000 ft. 1⅛" rope with 250 HP motor
1—Vulcan 60" Sliding pinion will coil 3500 ft. 1⅛" rope. 200 HP motor.
1—Lidgerwood-Cylindro Conical Shaft Hoist—225 ft. 1¼" rope. 300 HP motor.
1—Vulcan-Cylindro Conical Shaft Hoist 350' 1⅜" rope. 400 HP motor.
1—Connellsville-Cylindro Conical Shaft Hoist 350' 1½" rope. 800 HP motor.

And other hoists to suit all mining conditions

Jones Mining Equipment Co.
541 Wood Street Pittsburgh, Pa.

PIPE—MACHINERY—GAS ENGINES AIR COMPRESSORS—DIESELS—PUMPS

Some Steam Engines and Boilers available only slightly above the metal price

BRADFORD SUPPLY COMPANY
WAYNE, WOOD COUNTY, OHIO **Near Toledo**

IRON and STEEL PIPE

New and Used

Large Stocks, all sizes attractive prices

L. B. FOSTER COMPANY, Inc.
P. O. Box 1647 Pittsburgh, Pa.

HOIST

1—Ottumwa double drum, single gear reduction Electric Shaft Hoist, complete, in first-class condition, with 60 horsepower, 600 revolution, 220 volt, 3 phase, 60 cycle, General Electric motor.

LESLIE E. BRYANT
Clarksville, Arkansas

FOR SALE

Steel Tipple. Three track Roberts and Schaffer steel tipple with marcus shaker screen and loading boom, 150 to 200 ton capacity.
Also, one sandard model Goodman 12AB, 35 Horse power, 250 volt cutting machine completely rebuilt with spare armature.

Write **FS-218,** Coal Age
330 W. 42nd St., New York City

FOR SALE

1—Lorain 75A Combination shovel and drag line
2—Chicago Pneumatic 350 cu.ft. low pressure horizontal air compressors
1—50 horse power General Electric motor
1—Ingersoll Rand 160 portable compressor
Air drills, Air hammers, mall points, etc.

AIR COMPRESSORS RENTAL CO.
2324 East 105th Street, Cleveland, Ohio

Milwaukee (Westinghouse-Baldwin) gasoline locomotives, (3) 7-ton, 30" ga., 100% rebuilt.
Davenport, Porter & Vulcan steam locomotives (4), 18-ton, S/T, 36" ga., 10"x16" cyls.
Euclid 6-yd. bottom dump **crawler wagons** (8).
Freeman truck turntable, 7-10 ton, 28'x30".
Buckeye semi-Diesel eng.-gen. set, 260 HP.
Hydroelectric plant, 1200 HP, 60' head, A.C.
Bucyrus 50B **steam shovel front,** 2-yd.

H. Y. SMITH CO.
828 N. Broadway Milwaukee 2, Wis.

FOR CASH SALE

Complete Power House Equipment, including a Lazier Gas Engine, with K. W. Westinghouse Generator and switch board, volmeter, gasometer, 50 bbl. wood tank, 5 H.P. gas engine, Air compressor, and 2 air tanks, and one H. P. Burke Motor.

Tipple and Side Tract Equipment, including coal shute
Mitchell Crossover Dump
Howe Scales
5—40# **Switches** complete, with ¾ rails
34—85# **Rails**
51—60# **Rails,** and two frogs
1 **Robison** 4 ft. **Fan and Housing**
Cameron Bronze Pump, D.C. with 25 H. P. Westinghouse Motor
1 six ton **Jeffrey Motor,** outside wheels, 6102
1 **Spare Armature**
3 x 3 **Wyman Centrifugal pump** with 15 H. P. Ridgway motor
2—5 H. P. D.K. **Motor**
2—3 H. P. D.K. **Motor**
1—15 Triumph **Motor pulleys**
New expansion bolts and clamps
4-0 **trolley wire**—lot
Spare Armature for 5 H.P. Westinghouse Motor
Repair parts for locomotive, etc.

F. A. McINTYRE
Rimersburg, Penna.

FOR SALE

TRAMWAY

One Electric Reversible Tramway Manufactured by American Steel and Wire Company. One-man operation. Bucket Capacity 22 cu. ft.

The Barnes Coal & Mining Company
Box 277 Coshocton, Ohio

FOR SALE

Subject to Prior Sale

1 **Goodman Automatic Duckbill Type A.O.G. 16. Practically new, used six weeks. $585.00. Cash or Sight Draft, F.O.B. Scranton.**

GREENWOOD MINING COMPANY
Box 182 Scranton, Pa.

FOR SALE

Fairbanks Morse Railroad Track Scale

$5,500.00—Like new

Answer c/o P. O. Box #326
Pittston, Pennsylvania

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And, when you have special items to dispose of dealers will be glad to know of it or you can use this Searchlight Section to contact user-buyers direct, if you prefer. Send a list of your equipment and we will gladly give full space and rate information.

Departmental Staff

COAL AGE

330 W. 42nd St., New York

REBUILT EQUIPMENT—READY TO SHIP

MINING MACHINES—250 V. DC

1—CE-9 Sullivan
1—12AA Goodman 36" ga.
1—Goodman Slabbing 42" ga.

MINE LOCOMOTIVES

1—6 ton Atlas 36" ga. AC or DC
10 ton Milwaukee GASOLINE

ROTARY CONVERTERS

1—500 kw. G.E., type HC-8, 600 volt, 900 rpm, complete with transformers and switchboards
200 kw. G.E. 275 v. DC 900 rpm complete with transformers

M. G. SETS—SYNCHRONOUS

1—150 KW Ridgway 275 v. 900 rpm. 2300 v. 3 ph. 60 cy.

HOISTS

100 HP. Lidgerwood 2 drum AC or DC Motor

ROCK DRILLS

1—Ft. Wayne—2¼ HP 230/500 v. DC Motor

TRACK DRILLS

2—Moore Track Drills #1

PICKING TABLE

1—Jeffrey Apron Conveyor 5 HP DC Motor

SCALES

6—Fair. Morse #11½ 3 beams (2—200# ea. 1—50 lbs.) platform 16¼ x 21⅝

TRANSFORMERS—1 PH. 60 CY.

25—5 KVA 220 v. 122/244 G.E.
30—7½ KVA 2200 v. 122/244 G.E.
50—10 KVA 2200 v. 122/244 West.
3—37 KVA 4400 v. 185 v. Rotary Transformer
4—50 KVA 6600 v. 550 v. Allis Chal.
3—100 KVA 6600 v. 220/440/550 v. Pgh.
3—150 KVA 2300 v. 6900 v. Pgh.
1—150 KVA 2080 v. 230/460 G. E. 3 ph.
1—250 KVA 2300 v. 460 v. G.E. 3 ph.
3—1500 KVA 22000 v. 6600 v. Allis Chal.

CENTRIFUGAL PUMPS

2—1000 GPM Cameron bronze 100' hd. 8x8
1—800 GPM Weinman 90' hd. 6 x 5
1—750 GPPF DeLaval 70' hd. 6 x 6
1—Worthington 5 x 5 single stage mtd. on truck 15 HP motor

DIESEL ENGINE SET

1—217 KVA G.E. 2300/220/440 v. 3 ph. 60 cy. rpm. dir. con. to 260 HP Buckeye horiz. 2 cyl. Diesel

A. C. SQUIRREL CAGE MOTORS

H.P.	Volts	Make	Type	R.P.M.
250	550	G.E.	I-K	720
250	220/440	G.E.	KT	1200
225	2200/220/440	G.E.	Syn.	200
200	220	G.E.	I-K	600
200	2200	West.	CS	870
200	2200	G.E.	KT	1800
150	220	G.E.	I-K	450
150	550	G.E.	I-K	514
150	220/440	L. Allis	FX	1750
100	220/440	G.E.		1750

230 V. DC MOTORS

H.P.	Make	Type	R.P.M
25	Triumph	1750	———
25	Westg.	1700	S
25	Western Elec.	730	ELC
30	Westg.	1150	SK-110L
30	G.E.	1100	ELC
35	Westg.	950	S
35	Westg.	675	SK-140
40	G.E.	1700	RC-31
40	Westg.	935	S
50	G.E.	1700	DLC-202
50	Westg.	1700	S-8L
53	G.E.	1050	RC-33
55	Westg.	825	S
60	Westg.	875	SK-150
60	West.	850	———
125	Morg. Gardner	425	———
150	Cr. Wheeler	625	CCD
200	Westg.	400/800	———
300	Westg.	140	———

D.C. GENERATORS—250 V.

Qua.	H.P.	Make	R.P.M.
1	17½	Duquesne	1450
1	20	Westg.	1500
1	30	Westg.	1150
1	35	Westg.	800
1	40	Westg.	1150
1	50	G.E.	1200
1	50	Westg.	1050
1	60	Westg.	1050
1	100	G.E.	720
1	100	Westg.	500
1	100	Morgan Gardner	570
1	110	Cr. Wheeler	720
1	200	Westg.	505
1	250	Westg.	175
1	700	Westg.	450
1	750	Westg.	110

DUQUESNE ELECTRIC & MFG. CO. . . . . PITTSBURGH, PA.

CURRENT SPECIALS

Two—Ironton type WOD double motored 42" ga combination battery-trolley locomotives (without batteries). GE 80 volt ball bearing motors, worm & worm gear drive, ball bearing trucks. Good used condition. Extra trucks. Price, subject inspection and prior sale, $1250.00 each.

Two—Mansha single motored 36" ga battery locomotives (without batteries). As is, subject inspection and prior sale, $600.00 each.

One—Westinghouse six ton 42" ga trolley locomotive, Serial 47870, bar steel frame, two type 904, 250 volt motors, MB 24A controller, extra trucks. Good used condition. Price, subject inspection and prior sale, $2650.00.

One—100 KW Allis-Chalmers rotary converter, with three 40 KVA transformers, HV 6900, LV 185-92.5. As is, subject inspection and prior sale, $1350.00.

Two—562 KW Allis-Chalmers turbo-generators, 3 phase 60 cycle 2300 volt, complete with condensers, piping, valves, wiring and switchboards. Price, $10,000.00 per unit, subject inspection and prior sale.

One—General Electric-Lidgerwood 300 HP 3 ph 60 cy 2200 volt Mine Hoist, Serial No. 5169, motor serial No. 4013180. Complete with magnetic controller conical step-up drum, air brake, etc. Has had little use. Price $8250—subject inspection and prior sale.

HAIR EQUIPMENT COMPANY
Office and Warehouse
Reed and Election Streets
BENTON, ILLINOIS

NEW and REBUILT
STORAGE BATTERY
LOCOMOTIVES
1⅛ to 10 Ton — 18" to 56" Track Gauge
GREENSBURG MACHINE CO.
Greensburg, Penna.

MACHINE TOOLS
Lathes, Shapers, Milling Machines, Saws etc. for general maintenance work. We have a knowledge of the shop problems of the mine shop. Write or wire us your inquiries.
Cincinnati Machinery & Supply Co.
217 E. Second St. Cincinnati, Ohio

ROTARY CONVERTERS

500 KW G.E. SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM, Pedestal Type. 2300/4000 V. Transformers.
500 KW AL-CH SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM, Pedestal Type. 2300/4000 V. Transformers.
500 KW WEST. SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM, Pedestal Type. 2300/4000 V. Transformers.
300 KW G.E. SYN. 575 V. HCC, 6 Ph., 60 Cy., 1200 RPM, form P, 2300/4000 V. Transformers.
200 KW AL-CH SYN. 275 V. 6 Ph., 60 Cy. 1200 RPM, Pedestal Type, 2300/4000 V. Transformers.
150 KW G.E. SYN. 275 V. HCC, 6 Ph., 60 Cy., 1200 RPM, form P, 2300/4000 V. Transformers.

MOTOR GENERATORS

500 KW G.E. SYN. 600 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM, Manual Switchgear.
200 KW G.E. SYN. 275 V., 2300/4000 V. 3 Ph., 60 Cy., 720 RPM, Manual Switchgear.
200 KW G.E. IND., 600 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM, Manual Switchgear.
200 KW R.W. SYN., 275 V., 2300/4000 V., 3 Ph., 60 Cy., 900 RPM, 80% P..F Manual Switchgear.

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10-T WESTGHE, 250 V., 907-C Mts., 36"-44" Ga.
10-T WESTGHE, 500 V., 907-C Mts., 36"-44" Ga.
8-T JEFFREY, 250 V., MH-85 Mts., 24"-36" Ga.
8-T WESTGHE, 250 V., 906-C Mts., 36"-44" Ga.
8-T WESTGHE, 500 V., 906-C Mts., 36"-44" Ga.
8-T GOODMAN, 250 V., 132-A Mts., 36"-44" Ga.
6-T WESTGHE, 250 V., 904-C Mts., 36"-44" Ga.
4-T WESTGHE, 250 V., 902-C Mts., 36" Ga.

Each unit listed above is owned by us and is available now for immediate purchase.

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ERIE CATERPILLAR CRANE
Gas-air combination, with Waukeshaw gas engine 5¾x8—crane boom 45 ft. long, with extra drum on hoisting engine to operate timber grapple. In excellent second-hand condition—now operating. Can be inspected Scranton, Pa. Price—$7,500.00.

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Immediate Delivery

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5—*Sullivan CE 7*

Short Wall Machines

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2—*G.E. 6-ton Locomotives* 250 volt, 42" Gauge Bargain "As Is"!

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1214 Fisher Bldg.
Chicago, Ill.

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Complete Coal Tipples and Coal Handling Equipment

MORROW

MANUFACTURING CO. · WELLSTON, OHIO

DESIGNERS AND BUILDERS OF COAL HANDLING EQUIPMENT FOR OVER 25 YEARS

Shaking Screens
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Car Retarders
Settling Tank, Grizzlies

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THE U.S.S. OKLAHOMA IS RIGHT SIDE UP

AMERICAN CABLE TRU-LAY PREFORMED WIRE ROPE DID THE PULLING

Official U.S. Navy photograph

Pearl Harbor, Hawaii. Even Date—The 29,000 ton U.S.S. "Oklahoma" is again afloat. During months of preparation by the Pacific Bridge Company, some 50 miles of TRU-LAY Preformed and CRESCENT Non-Preformed wire rope (ranging in diameter from 1″ to 3″) was shackled to the huge ship, then in less than 69 hours operating time the "battlewagon" was pulled out of her list of 151 degrees back to within 10½ degrees of natural position.

For this spectacular job, a sling or bridle was put over the ship. This bridle was made of 42 lengths (averaging 360′) of 3″ CRESCENT Non-Preformed rope. Attached to this were 21 reels (10,000′ each) of 1″ TRU-LAY Preformed wire rope. These were attached to winches ashore, and after less than three days steady pulling, the "Oklahoma" was right side up.

The American Cable Division, not only for this shining example but for its less spectacular day-in and day-out effort, is proud to be numbered among those who are working to speed the war's victorious end.

AMERICAN CABLE DIVISION Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Portland, Tacoma

AMERICAN CHAIN & CABLE COMPANY, INC.

BRIDGEPORT, CONNECTICUT

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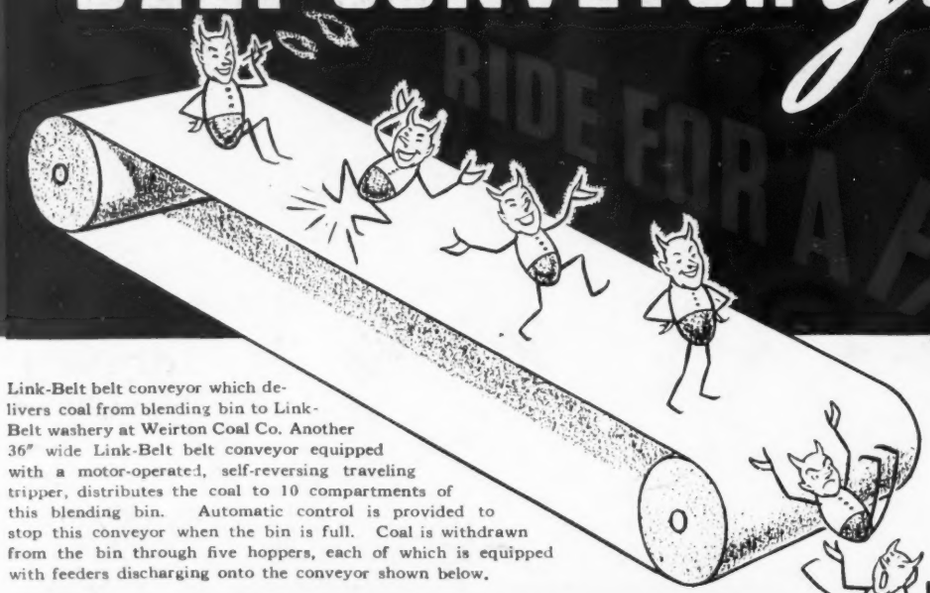
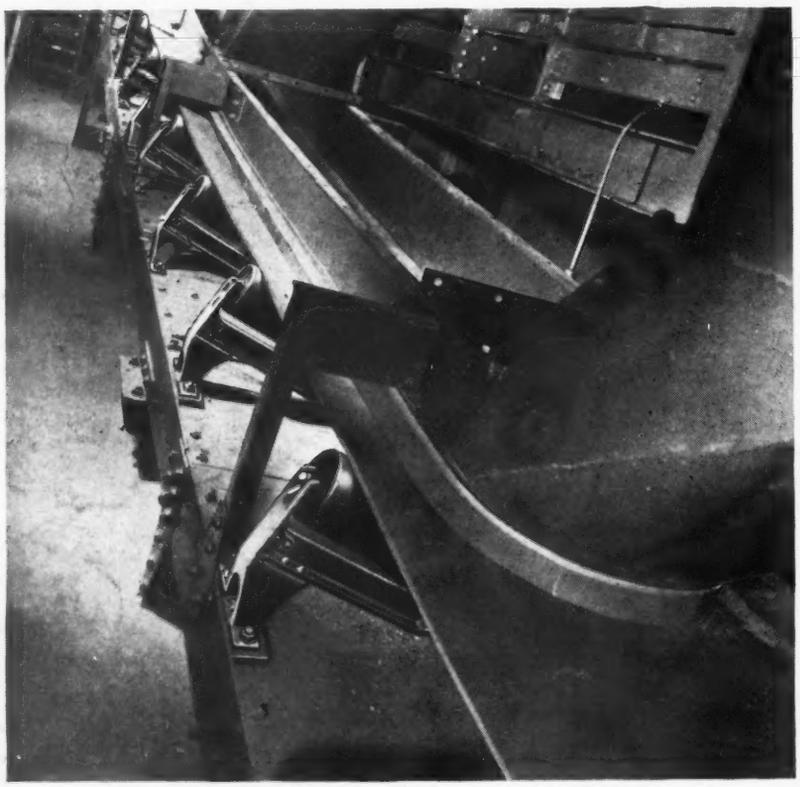
BELT CONVEYOR *Gremlins*



Link-Belt belt conveyor which delivers coal from blending bin to Link-Belt washery at Weirton Coal Co. Another 36" wide Link-Belt belt conveyor equipped with a motor-operated, self-reversing traveling tripper, distributes the coal to 10 compartments of this blending bin. Automatic control is provided to stop this conveyor when the bin is full. Coal is withdrawn from the bin through five hoppers, each of which is equipped with feeders discharging onto the conveyor shown below.



WHEN YOU DO THESE SIX THINGS:

1. KEEP INSTALLATION CLEAN

Make periodic inspections daily t see that there is no accumulation material that has spilled off the belt

2. USE IMPACT IDLERS . .

Rubber-tread impact idlers at loadin and transfer points will prolong be life by preventing cutting and bruis ing.

3. "TRAIN" THE BELT . .

For efficient operation, keep both th carrying and return runs of a conve or belt practically centered on th supporting idlers.

4. MAINTAIN THE "TRAINING

Maintaining the "training" of the be on the conveyor is assured at all tim if self-aligning idlers are used.

5. MAINTAIN BELT TENSIO

Proper belt tension eliminates exce sive belt sag between idler rolls a prevents unnecessary wear.

6. LUBRICATE PROPERLY . .

Never over-lubricate idler rolls a other moving parts, for too mu lubrication is as bad as too little.

GREMLIN CHASERS: Inspect equipment regularly—and make replacements with genuine Link-Belt parts when necessary. Link-Belt manufactures a complete line of idlers, pulleys, bearings, take-ups, drives, trippers, etc., built for every service.

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